THE FISHES OF OCEANIA

By Henry W. Fowler

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Volume X

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HONOLULU, HAWAII
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HENRY W. FOWLER, ICHTHYOLOGIST AND ASSOCIATE CURATOR OF VERTEBRATE ZOOLOGY, ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA, SERVED AS BISHOP MUSEUM FELLOW IN YALE UNIVERSITY, 1922-23. THE FISHES OF OCEANIA IS THE MOST COMPREHENSIVE OF HIS MANY AUTHORITATIVE WORKS DEALING WITH PACIFIC FISHES. THE PREPARATION OF THIS MEMOIR HAS OBVIOUSLY INVOLVED MANY YEARS OF CAREFUL RESEARCH AND THE INTELLIGENT USE OF EXCEPTIONALLY LARGE KNOWLEDGE GAINED FROM LABORATORY INVESTIGATION, ANALYSIS, COMPARISON, AND STUDY OF WIDELY SCATTERED LITERATURE.

Dedicated to Charles Montague Cooke, Jr., Friend, Naturalist, Conchologist, as a tribute to his unselfish interest and influence in the many scientific projects which have their center in the Bishop Museum at Honolulu. To him I owe the inception of this work and the encouragement of his steadfast friendship. Through him I was enabled to study new and interesting fishes, many of them the most beautiful of their kind. May the memory of a charming season in Honolulu never dim.

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INTRODUCTION

SCOPE AND PURPOSE

This work is primarily the result of an examination of the fishes stored in the Bernice P. Bishop Museum embracing some 14,000 specimens. These include the large Hawaiian collections—the local accessions of the Museum since its inception: the collections made by Mr. Alvin Seale in the South Pacific (1900-1903)[1] and in Guam (1900)[2], those made by Hans G. Hornbostel in Guam (1923)[3], by the Tanager Expedition (1923)[4] and by the Whippoorwill Expedition (1924).[5]

During the early part of 1922 a Bishop Museum Fellowship in Yale University was granted me. With Mrs. Fowler I arrived at Honolulu September 13. Work was started on the collections shortly afterward so by January of 1923 the examination was completed. A set of duplicate specimens reserved for The Academy of Natural Sciences of Philadelphia was sent to Philadelphia for later study. I left Honolulu January 17, 1923, and after spending the remainder of the winter chiefly in California, returned to Philadelphia early in April. Work was then resumed on the collections sent home and on the manuscript.

In July 1923 I went to the Museum of Comparative Zoology at Harvard University, where Professor Samuel Henshaw, the Director, Dr. Thomas Barbour, and Professor Samuel Garman, very kindly placed at my disposal the materials from Oceania, including the interesting collections of Andrew Garrett, and several others not previously reported. I therefore had the advantage of studying this especially valuable lot of material, most all of which was identified by that distinguished ichthyologist, the late Franz Steindachner of Vienna. It is noteworthy to recall that Dr. Steindachner had long ago anticipated some discoveries only brought to light by more recent investigators. A number of specimens were kindly loaned by the Museum and sent to Philadelphia, so that more complete notes and comparisons could be made.

In October 1923, I went to Washington and obtained permission from the United States National Museum, to examine the fishes contained in the collections from Oceania. I also received every attention and assistance desired from my friend and colleague, Mr. Barton A. Bean, in charge of the Division of Fishes. The large series of specimens, chiefly obtained by the Bureau of Fisheries, were looked over wherever practicable and others of more special interest studied and determined. Several years ago I had the good fortune to study the fishes obtained by the United States Exploring Expedition 1839-1841, under the command of Captain Charles Wilkes. This collection contains some of the earliest fishes brought to America from the south Pacific, the records of which by permission of the United States National Museum are included in this work.

The specimens from Oceania in the old collection of The Academy of Natural Sciences of Philadelphia which I described in 1900[6] are only briefly listed here. Several rare or unusual species are described.

In order to locate the materials of the various museums I have referred to the Bernice P. Bishop Museum simply as the "Bishop Museum," the United States National Museum as the "National Museum," the Museum of Comparative Zoology as the "Agassiz Museum," and The Academy of Natural Sciences of Philadelphia as the "Academy."

This report pertains only to that part of the tropical Pacific commonly known as Oceania, and is presented in full realization that it is only a contribution to the knowledge of the ichthyfauna of that vast area of ocean expanse. Possibly not much more than half the species of fishes actually living in Oceania have been described, and the distribution based upon only a few records. Annotations from such materials as have been available are included. All references relating to Oceania, with their respective localities, are given under each species. The original reference is given and with the type locality, thus contributing to knowledge of the

[1] Seale, Alvin, Fishes of the South Pacific: B. P. Bishop Mus. Occ. Papers, vol. 4, no. 1, 1906.

[2] Seale, Alvin, Report of a mission to Guam: B. P. Bishop Mus. Occ. Papers, vol. 1, no. 3, pp. 17-128, 1900.

[3] Fowler, Henry W., Fishes of Guam, Hawaii, Samoa and Tahiti: B. P. Bishop Mus. Bull. 22, pp. 4-22, 1925.

[4] Fowler, Henry W., and Ball, Stanley, Fishes of Hawaii, Johnston Island, and Wake Island: B. P. Bishop Mus. Bull. 26, 1925.

[5] Fowler, Henry W., Fishes of the tropical central Pacific: B. P. Bishop Mus. Bull. 38, 1927.

[6] Fowler, Henry W., Contributions to the ichthyology of the tropical Pacific: Acad. Nat. Sci. Philadelphia, Proc., pp. 493-528, 1900.

range in Oceania. For extra-limital forms the range is briefly outlined. Where materials were not available from Oceania I have given a few, usually brief, lines of diagnosis, compiled from original or trustworthy descriptions.

The sequence of families used is mainly that given by Jordan[7]. The limitations there used are, however, freely modified or defined, many as used in my previous papers. The genera accepted are such as may conform to a somewhat conservative estimate. It seems more satisfactory to me to retain some of the older limits than admit a lot of slightly differentiated species as full genera. In a faunal work such as this, the purely taxonomic questions are largely secondary. The report on the fishes of New South Wales by the late Allan R. McCulloch, a work of somewhat similar intent, has called forth a review with some pertinent remarks[8]:

> According to the very modern classification adopted, ... This gives an average of little more than one and a half species to a genus, and somewhat over two genera to a family! So the modern vice of "limitation of families" is clearly not confined to the human race itself, but has even affected zoological classification. One begins to wonder whether this kind of classification is going to serve any useful purpose; would it not be better for us all to fall into line and cheer the modern "splitters" on, so that they could more quickly "go the whole hog," and accomplish the course which they have already nearly half completed? That is to say, let us be done with it, and let each species have a family and genus of its own! Entomologists have long been complaining of their "splitters;" let them now study fishes, and then call upon "whatever gods there be" to help them when the half-million species of insects are classified along the same lines as these.

To my wife, who accompanied me to Hawaii, I am indebted for much assistance in finally producing this report. Acknowledgment is also due to members of the Bishop Museum staff for many favors and courtesies, Dr. H. E. Gregory, Dr. Stanley C. Ball, Dr. C. Montague Cooke, Miss Elizabeth Higgins, and Mr. John W. Thompson. In many ways all have helped to make my visit to Honolulu successful as well as filled with many pleasant memories.

OCEANIA

Oceania is virtually the eastern region of the vast Indo-Pacific realm and covers an area greater than the entire Indian Ocean. As treated in this paper, it comprises four principal faunal divisions: Melanesia, including the islands of Papua (New Guinea) and Waigiu, Micronesia, Polynesia, including Fiji, and Hawaii. The principal islands as recorded by Brigham[9] are listed below. Islands from which fishes have been obtained are indicated by the asterisk.

MELANESIA

As Melanesia lies nearest the East Indies, from which most of its fishes have been derived, some species extend no further eastward. There is also a strong tinge of the Australian littoral. At Waigiu, Bleeker found a greater number of species of fishes than on any other island in the southwest Pacific—East Indian region. Little is known of the ichthyfauna of Papua (New Guinea), as most of the earlier records pertain to Dorey (Doreh)* in Dutch New Guinea and Port Moresby* in Papua.

The Louisiade Archipelago consists of more than eighty islands, besides many rocks and reefs. The principal islands are Kiriwina and Duau (Normamby)* in the D'Entrecasteaux group, Dauila, Moratau, and Murua (Woodlark)*.

In the "Bismark Archipelago," Admiralty Island*, the largest of seven chief islands and many islets comprising the Admiralty Islands has a few records of fishes. Of the 16 other islands, chief are New Britain (New Pommern)*, New Ireland (New Mecklenburg)*, New Hannover*, and Duke of York*.

The Solomon Islands comprise 13 islands, chief of which are Bougainville*, Shortland*, Choiseul, Rubiana, Ysabel, Guadalcanar, Malaita, and San Cristobal.

The New Hebrides form two groups: Santa Cruz Islands comprising six islands, with Vanikoro (Vanicolo)* and Nitendi as noteworthy and Banks Islands with 20 islands, chief of which are Vanua Levu, Gaua, Maiwó, Espiritu Santo*, Aoba, Arag, Malekula*, Ambrym, Api*, Fate (Vate)*, Eromanga, Tanna*, Aneiteum*, and Futuna.

New Caledonia comprises the islands of New Caledonia*, Huon, Belep, and Isle of Pines.

The Loyalty Islands* include Uea, Lifu, Mare, and Walpole* islands.

MICRONESIA

In general, the fishes of Micronesia differ little from those of Polynesia although the shore fish are more like those of the East Indies than those of Hawaii.

The Pelew Islands* contain six principal islands and many islets. But few fishes have been reported.

The Caroline Islands embrace nearly fifty groups, most of which are atolls. Wolea (Ulea)*, Yap*, Ruk*, Ponape (Ascension)*,

[7] Jordan, D. S., A classification of fishes: Stanford Univ. Publ., Univ. Ser., Biol. Sci., vol. 3, no. 3, pp. 77-244, 1923.

[8] R. J. T., Reviews and abstracts: New Zealand Jour. of Sci. and Technology, vol. 5, no. 4, pp. 233-234, 1922.

[9] Brigham, W. T., Index to the islands of the Pacific: B. P. Bishop Mus., Mem., vol. 1, no. 2, 1900.

Kusaie (Ualan or Strong)* are of interest. With the Carolines are here included Mortlock Island* and Wake Island.*

The Marshall Islands consist of two groups. The Ralick chain comprises 18 islands and 132 islets, of which Jaluit (Bonham)* and Ebon (Boston)* islands are noteworthy. In the Ratack chain are 16 islands and 250 islets, with Arno* and Wotje* of interest.

The Gilbert Islands form the Scarborough group including Apaing (Charlotte) Island*, the Simpson group of three islands, and the Kingsmill group including Apamama* of seven islands.

The Marianas Island (Ladrones)* comprise only 16 islands, including Guam*, from which a fair representation of fishes is now known.

From Bonin Islands*, a group of four small islands, important collections were made by Captain William Stimpson. The Bishop Museum has a small collection from Marcus Island.*

POLYNESIA

The fishes of Polynesia merge well with those of Micronesia. They carry many East Indian and Melanesian forms to the eastward.

Fiji (technically a part of Melanesia, but placed for faunal purposes in Polynesia) comprises about 155 islands and many islets and reefs. The principal islands are Viti Levu*, Ovalau*, Kandavu*, Totoya*, Ngau, Goro, Taviuni, and Vatoa.

Ellice Islands comprises 9 low atolls and 7 islets. Only Funafuti (Ellice*) and Rotuma* are of interest.

Tonga (Friendly Islands) comprises 150 islands and islets. Vavau* and Hapai* groups and Tongatabu* are noteworthy.

Samoa comprises 13 islands generally surrounded by coral reefs. Savaii*, Upolu*, and Tutuila* are noteworthy.

In the Phoenix Islands a few fishes have been collected at Hull Island* and Canton Island.*

The Cook Islands (Hervey Islands) comprise a group of eight islands, including Aitutaki, Atiu, Mangaia, and Rarotonga*.

Society Islands include Bellingshausen*, Borabora (Bolabola*), Tahaa*, Huaheine*, Tapamanu, Moorea, and Tahiti*

Austral Islands consist chiefly of eight islands, among which Tubuai*, Vavitao, and Rurutu are noteworthy.

The Tuamotus (Low Archipelago) comprise 78 atolls, each with many islets and all very similar. Chief among them are Tikahau, Makatea*, Rangiroa*, Arutua, Apataki, Kaukura, Toau, Takaroa*, Takapoto, Aratika, Kawehe, Raraka*, Fakarava*, Taaite, Anaa, Katiu, Motutunga, Makemo*, Taenga, Raroia, Manaka, Amanu, Hereheretui, Reao, Pukaruha, Mururoa, Marutea, Mangareva (Gambier*)-Pitcairn Island*, and Easter Island* may also be classed here.

The Marquesas comprise Eiao, Nukuhiva*, Huapu, Huahuna, Hivaoa, and Fatuhiva principally.

A few islands, lying between the Hawaii and Cook Islands may be noticed here. Such are Palmyra*, Washington*, Fanning*, Christmas*, Jarvis*, Baker (New Nantucket)*, Tongareva (Penrhyn)*, Rakaanga, Manahiki, and Thornton (Caroline*).

HAWAII

Hawaii consists of eight principal islands and a long row of smaller uninhabited islands, extending north westward from Kauai. Those of faunal interest include Hawaii*, Kahoolawe*, Maui*, Lanai*, Molokai*, Oahu*, Kauai*, Niihau*, Nihoa* (Bird Island*), Necker*, French Frigates Shoal*, Gardiner*, Laysan*, Lisianski*, Pearl and Hermes Reef*, Midway*, and Ocean*. Johnson Island* also may be placed here.

DISTRIBUTION

The seas of Oceania, the largest in the world, abound with fishes. Because of their vivid colors these fishes have attracted attention from the time of the early voyagers and explorers down to the present day, but due to incomplete or incidental records very little is known of their distribution. Doubtless when more localities are visited and extensive materials properly gathered, many species will be found to range much more widely than existing records indicate. Many descriptions of "new species" are really only expressions of an author's ignorance of distribution.

Although many sections, such as South Africa, East Africa, the Arabian Sea, the Bay of Bengal, the China Sea, the East Indies, the coasts of northern Australia, Melanesia, Micronesia, Polynesia, and Hawaii may be defined more or less loosely as major faunal subregions, there still remains a large element of homogeneity in distribution.

In order to illustrate more clearly this condition of distribution I have listed below some of the principal species in their regular family sequence. They include a very small number of the grand total actually known from Oceania. All range from East Africa or the western Indian Ocean eastward well into Polynesia and are therefore equally established as Polynesian elements. The many forms derived from truly

Indian or East Indian centers of dispersal and extending only into Melanesia, are omitted. Some of the more widely ranging species, more or less circumtropical, are included and indicated by a prefixed asterisk. The Indo-Pacific measure of Oceanian ichthyfauna thus becomes fairly apparent.

BRANCHIOSTOMIDAE

The small, primitive, transparent, fusiform little lancelets are of very wide distribution. They are doubtless abundant in Oceania, even if local. No species has yet been formed ranging entirely across the Indo-Pacific.

ELASMOBRANCHS

Comparatively few forms have been noticed and many are of wide or general distribution. Besides the species here listed among the rays the genera *Rhinobatos, Urolophus, Aetobatus,* and *Manta* occur.

* Rhineodon typus
* Carcharodon carcharias
* Isurus glaucus
* Alopias vulpinus
* Galeorhinus galeus
Triaenodon obesus
* Galeocerdo arcticus
* Glyphis glaucus
Eulamia sorrah
melanopterus
Eulamia gangeticus
Aprionodon acutidens
* Sphyrna zygaena
* Isistius brasiliensis
Euprotomicrus bispinatus
Dasyatis gerrardi
sephen
kuhlii
Taeniura lymma
Pteroplatea poecilura

ELOPIDAE

The tarpons have a few widely distributed genera, though the species are evidently less interoceanic. They are moderate sized or large fishes, with ribbon-like larvae.

Megalops cyprinoides

ALBULIDAE

The bone fishes are weaker than the tarpons, of moderate size, brilliantly silvery. Of the two living forms one is circumtropical.

* Albula vulpes

CHANIDAE

The milkfishes are represented by a single species, abundant throughout the Indo-Pacific. It is rather large, finely scaled, silvery and toothless.

Chanos chanos

CHIROCENTRIDAE

The single species, in the Indo-Pacific, a large, compressed band-like herring, differing in its strong dentition.

Chirocentrus dorab

GONORHYNCHIDAE

The sand eels are of moderate size, with spiny scales, elongated cylindrical bodies and snout with an infraterminal barbel. Semipelagic and extending more or less into subtropical waters.

Gonorhynchus gonorynchus

CLUPEIDAE

In the large family of true herrings several genera are wide ranging. Many swim in immense schools and are of great economic value.

Stolephorus delicatulus
japonicus
Sardinella perforata
jussieu
melanura
Sardinella sirm
Harengula punctata
vittata
Clupeoides lile

ENGRAULIDAE

The anchovies are weak little fishes, living in large schools along shores or reefs. They have a long slender maxillary, protruding snout and most of them are silvery or have a bright silvery lateral band.

Engraulis baelama
setirostris
Engraulis indica

MURAENIDAE

In these, the true eels, minute, embedded scales are present. The species are now grouped according to major areas of distribution. Marine, the females in fresh water.

Muraena mauritiana

MURAENESOCIDAE

The pike eels have a more elaborate dentition than the related congers, with prominent canine teeth, a long slender snout and are of large size.

Muraenesox cinereus

CONGRIDAE

The congers are all marine, mostly large, without scales and with well-developed vertical and pectoral fins.

Conger cinereus

OPHICHTHYIDAE

The snake eels have the end of the tail ending in a firm point, with no caudal fin. Many are brightly or variously colored, their markings often suggesting serpents.

Myrichthys colubrinus
maculosus
Callechelys marmoratus
Callechelys melanotaenia
Pisoodonophis cancrivorus
Brachysomophis crocodilinus

ECHIDNIDAE

The morays have no pectoral fins and in some forms the fins are all absent. Most are large, thick-skinned, strong, pugnacious, with molar or sharp, knife-like teeth and variously mottled or speckled. Many are found in the crevices of coral banks.

Echidna zebra
polyzona
nebulosa
Evenchelys macrurus
Strophidon brummeri
Lycodontis picta
melcagris
petelli
Lycodontis ruppelli
flavomarginata
undulata
favaginea
richardsonii
nudivomer
Uropterygius concolor
marmoratus

PLOTOSIDAE

Of the siluroids only the present family with one littoral marine species. It is attenuated and with two white longitudinal stripes.

Plotosus anguillaris

SYNODONTIDAE

The lizard fishes are small, slender, cylindrical, scales cycloid, and mouth rather wide. Some are wide-ranging and others bathypelagic.

* Trachinocephalus myops
Synodus japonicus
Saurida gracilis
tumbil

BELONIDAE

The needle fishes are very slender, elongated, with slender or forceps-like jaws, well toothed and scales minute. Many are widely distributed and live near the surface.

Belone platyura
Strongylura indica
* Strongylura choram
* Ablennes hians

HEMIRAMPHIDAE

The herbivorous balaos are readily known by the elongated shaft-like lower jaw, the upper jaw very short. Like the needlefishes they live near the surface and some are semipelagic.

* Euleptorhamphus longirostris
* Hemiramphus brasiliensis
Hemiramphus far
marginatus

EXOCOETIDAE

The flying fishes are mostly pelagic, swimming near the surface and leap out and glide for considerable distances.

Parexocoetus brachypterus
* Exocoetus volitans
* Cypselurus rondelettii
* rubescens
* nigricans
Cypselurus altipennis
* furcatus
oligolepis
* bahiensis

PLEURONECTIDAE

The flounders are poorly represented in comparison with their abundance in cooler regions.

Platophrys mancus
Platophrys pantherinus

HOLOCENTRIDAE

The soldier fishes are well represented. Most are

brilliant red, with large rough scales and the bones of the head spinescent.

Ostichthys japonicus
Holocentrus ruber
caudimaculatus
lacteoguttatus
laevis
diadema
Holocentrus spinifer
sammara
Holotrachys lima
Myripristis murdjan
adustus
hexagonus

SYNGNATHIDAE

Most pipe fishes are long and slender, the body covered with bony plates. Males with an egg pouch under the tail, on some located on the abdomen. Though poor swimmers, many are widely distributed by currents.

Choeroichthys sculptus
Doryrhamphus melanopleura
Doryrhamphinarum brachyurum
Syngnathus spicifer
Corythoichthys flavofasciatus
Hippocampus histrix
kuda

AULOSTOMIDAE

The trumpet fishes have a long compressed body covered with ctenoid scales, head long and small mouth at the end of the long, compressed snout. Species few, many brightly colored, rather small and widely distributed.

Aulostomus chinensis

SPHYRAENIDAE

The barracudas are large, voracious pike-like fishes, with small scales and powerful dentition. Some are widely distributed.

* Sphyraena barracuda
jello
Sphyraena japonica
obtusata

POLYNEMIDAE

The thread fins are known chiefly by the free filaments in the pectoral fin, in addition to the usual rays. These filaments in some are longer than the body.

Polydactylus plebeius
Polydactylus sexfilis

SCOMBRIDAE

The mackerels all have the last dorsal and anal rays forming a series of finlets. Many species are pelagic.

* Scomber japonicus
kanagurta
Rastrelliger brachysoma
Scomberomorus commerson
* Auxis thazard
* Euthynnus pelamis
* alletteratus
* Thunnus thynnus
* Germo alalunga
* Acanthocybium solandri

GEMPYLIDAE

The escolars are elongated and slender, with strong dentition. Most are widely distributed or bathypelagic.

* Promethichthys prometheus

XIPHIIDAE

The sword fishes are readily known by the long depressed blade-like rostrum. One species, very muscular and of large size.

* Xiphias gladius

CORYPHAENIDAE

The dolphins are large elongate fishes, with prominent dorsal and forked caudal fins. Their colors are brilliant and changeable.

* Coryphaena hippurus
* Coryphaena equiselis

CENTROLOPHIDAE

Most of the rudder fishes are small, with oblong bodies covered with cycloid scales. Most all are pelagic, often found under floating medusae.

* Nomeus gronovii
* Psenes cyanophrys

CARANGIDAE

The crevalles are a large group of swift swimmers and are widely distributed. In many the hind part of the lateral line is armed with bony plates.

Scomberoides lysan
toloo parah
sancti-petri
* Naucrates ductor
* Elagatis bipinnulatus
Megalaspis cordyla
* Decapterus sanctae-helenae
* Selar crumenophthalmus
Caranx mate
* ascensionis
Caranx ignobilis
sexfasciatus
Gnathanodon speciosus
Carangoides ferdau
Carangoides armatus
Blepharis ciliaris
Scyris indica
Trachinotus ovatus
baillonii

LEIOGNATHIDAE

The pouters are all small, with very protractile jaws, many very steeply so. Most are of the Indo-Pacific.

Leiognathus equula
fasciatus
Secutor insidiator
Gazza minuta

CHEILODIPTERIDAE

The cardinal fishes are all small, many red in color, with large scales and most of them with two anal spines.

Amia bandanensis
novemfasciata
frenata
fusca
Apogonichthys auritus
Archamia lineolata
Cheilodipterus lineatus
quinquelineatus

AMBASSIDAE

An Indo-Pacific group, a few entering fresh water. Most have more or less translucent bodies, small or moderate cycloid scales, two anal spines, and silvery colors.

Ambassis ambassis
dussumieri
Ambassis urotaenia

KUHLIIDAE

A small Indo-Pacific group, most entering fresh waters. Colors dull or somber, moderate scales ctenoid and three anal spines.

Kuhlia rupestris
marginata
Kuhlia taeniura

SERRANIDAE

The sea basses occur in all warm seas, mostly marine. The maxillary is free from the preorbital, palate well toothed, scales small, and anal spines three.

Variola louti
Cephalopholis sonnerati
argus
miniatus
urodelus
sexmaculatus
leopardus
Serranus fasciatus
flavo-caeruleus
maculatus
gilberti
* Serranus septemfasciatus
merra
tauvina
caeruleo-punctatus
summana
fuscoguttatus
lanceolatus
Anyperodon leucogrammicus
Anthias pleurotaenia
Grammistes sexlineatus
Plesiops nigricans

PRIACANTHIDAE

The catalufas are rosy, finely scaled, with large eyes and a free maxillary. Several are widely distributed.

* Priacanthus boops
* cruentatus
Priacanthus hamrur

PEMPHERIDAE

Ovate compressed little fishes, the small dorsal of few spines and rays and anal with a long base. Some live in deep water.

Pempheris mangula

LUTJANIDAE

The snappers are rather large, brilliant shore fishes with a sheathed maxillary; most of them have teeth on the palate.

Apsilus zonatus
Aprion virescens
* Etelis carbunculus
Aphareus furcatus
Lutjanus kasmira
johnii
bohar
Lutjanus fulviflamma
marginatus
gibbus
monostigma
argentimaculatus
niger

POMADASIDAE

The grunts are oblong, mostly elevated, with sheathed maxillary and toothless palate. Shore fishes, most of them restricted in range.

Caesio caerulaureus
Plectorhinchus chaetodonoides
pictus
Plectorhinchus crassispinus
albovittatus

THERAPONIDAE

Small Indo-Pacific fishes, silvery and with longitudinal

dark bands. Allied with the grunts, sometimes found in tidal or fresh waters.

Therapon jarbua

LETHRINIDAE

Differ from the sparids in having front canines and lateral uniserial molars, also cheeks scaleless. Mostly Indo-Pacific, one ranging into the eastern Atlantic.

Lethrinus mahsena
Lethrinus mahsenoides
Lethrinus ramak
Lethrinus harak
Lethrinus nebulosus

SPARIDAE

Most of the porgies are elevated and oblong, with rather large ciliated scales, front teeth incisors and hind ones molars.

Monotaxis grandoculis

KYPHOSIDAE

Herbivorous fishes finely and closely scaled, also vertical fins. Colors dull.

Kyphosus cinerascens
Kyphosus fuscus

GERRIDAE

The mojarras are small silvery fishes with very protractile jaws, greatly like the pouters. Live in large schools, mostly on sandy shores, but few widely distributed.

Gerres argyreus
Gerres oyena

MULLIDAE

The sur-mullets are brilliant market fishes, with rather large scales and two simple barbels at the chin.

Upeneoides vittatus
Upeneoides sulphureus
Upeneus bifasciatus
Upeneus indicus
Upeneus pleurostigma
Upeneus fraterculus
Upeneus chryserydros
Mulloides auriflamma
Mulloides erythrinus

MALACANTHIDAE

The blanquillos are elongated, with long soft dorsal and anal fins, the few fin spines feeble.

Malacanthus hoedtii
Malacanthus latovittatus

CIRRHITIDAE

These fishes have the lower pectoral rays simple or unbranched and thickened. Many are richly colored and abundant about coral rocks and reefs.

Cirrhitus pinnulatus
Paracirrhites arcatus
Paracirrhites forsteri
Paracirrhites cinctus

MONODACTYLIDAE

Most of the half moon fishes are Indo-Pacific, a few sub-Antarctic and in the eastern Atlantic. All are deep bodied, most of them silvery and some deeper than long.

Monodactylus argenteus

PLATACIDAE

A small group of orbicular, strongly compressed fishes, with high vertical fins, moderate in size and dark or somber in color. All in the Indo-Pacific or Indian region.

Platax orbicularis

DREPANIDAE

Small deep-bodied fishes with very long pectorals and silvery, otherwise like the butterfly fishes.

* Drepane punctata

CHAETODONTIDAE

The butterfly fishes are among the richest colored of coral reef forms, active, brilliant and graceful in every way. All are greatly compressed, with disk-like forms and closely scaled.

Chaetodon trifasciatus
Chaetodon semeion
Chaetodon lunula
Chaetodon unimaculatus
Chaetodon kleinii
Chaetodon auriga
Chaetodon setifer
Chaetodon vagabundus
Chaetodon lineolatus
Heniochus monoceros
Heniochus acuminatus
Holacanthus diacanthus
Holacanthus imperator

ZANCLIDAE

The Moorish idols resemble the butterfly fishes but with the scales reduced to minute asperities and the dorsal spines filamentous. The contrasted colors of black, white and yellow bands.

Zanclus canescens

HEPATIDAE

The tangs are herbivorous coral reef fishes, the side of the tail with one or more bony plates or strong spine, the spine movable and capable of severely wounding. Most have dull or somber colors.

Hepatus triostegus
Hepatus guttatus
Hepatus fuliginosus
Hepatus bariene
Hepatus glaucopareius
Paracanthurus theuthis
Ctenochaetus strigosus
Zebrasoma flavescens
Zebrasoma rhombeum
Zebrasoma veliferum
Naso lituratus
Naso eoume
Naso brevirostris
Naso unicornis

SIGANIDAE

Herbivorous fishes of the Indo-Pacific, unique in the ventral fin with two strong spines and three soft rays between. Also the anal with six or seven spines.

Siganus vermiculatus
Siganus stellatus
Siganus fuscescens
Siganus rostratus

SCORPAENIDAE

The rock fishes have the very large head armed above with spines, the body of most scaly and pectorals large. Many live among coral rocks.

Scorpaenopsis gibbosus
Sebastapistes bynoensis
Pterois volitans
Pterois antennata
Dendrochirus zebra
Amblyapistus taenianotus
Synanceja verrucosa

CARACANTHIDAE

A small group of coral reef fishes in the Indo-Pacific. They differ from the rock fishes in the well compressed body and small fins.

Caracanthus maculatus

CEPHALACANTHIDAE

The flying gurnards are semipelagic, with lesser powers of flight than the true flying fishes.

Dactyloptena orientalis

POMACENTRIDAE

The demoiselles are very active brilliant little fishes of the coral reefs, often left in tide pools. They are trim and shapely and greatly suggest the butterfly fishes in mode of life.

Amphiprion polymnus
Dascyllus trimaculatus
Dascyllus marginatus
Dascyllus aruanus
Chromis dimidiatus
Pomacentrus pavo
Pomacentrus littoralis
Pomacentrus lividus
Pomacentrus nigricans
Abudefduf sexfasciatus
Abudefduf sordidus
Abudefduf septemfasciatus
Abudefduf leucozonus
Abudefduf dickii
Abudefduf biocellatus

LABRIDAE

The wrasse fishes are abundant on reefs or among rocks, most of them larger than the demoiselles and brilliantly colored. Many have strong teeth for crushing the shells of mollusks, on which they feed.

Lepidaplois perdito
Lepidaplois bilunulatus
Lepidaplois axillaris
Lepidaplois hirsutus
Epibulus insidiator
Labrichthys cyanotaenia
Labroides dimidiatus
Anampses geographicus
Anampses caeruleopunctatus
Anampses diadematus
Stethojulis strigiventer
Stethojulis axillaris
Stethojulis renardi
Hemigymnus fasciatus
Halichoeres centriquadrus
Halichoeres scapularis
Halichoeres marginatus
Halichoeres margaritaceus
Halichoeres nebulosus
Coris angulata
Coris variegata
Coris gaimard
Hologymnosus semidiscus
Thalassoma quinquevittata
Thalassoma hardwicke
Thalassoma lunare
Thalassoma umbrostigma
Thalassoma purpurea
Gomphosus varius
Cheilio inermis
Pseudocheilinus hexataenia
Cheilinus trilobatus
Cheilinus fasciatus
Cheilinus undulatus

Cheilinus digrammus
chlorurus
Novaculichthys taeniourus
Cymolutes lecluse
Hemipteronotus pentadactylus
Iniistius pavo
aneitensis

CALLYODONTIDAE

Most of the parrot fishes are brilliant, herbivorous, large, the jaws with a bony beak and the scales large.

Scarichthys auritus
caeruleopunctatus
Leptoscarus viridescens
Callyodon erythrodon
sordidus
harid
pulchellus
janthochir
caudofasciatus
Callyodon pectoralis
blochii
rubroviolaceus
dubius
globiceps
nuchipunctatus
ghobban
guttatus
bicolor

ELEOTRIDAE

The guavinas are scaly with separated ventral fins of moderate or small size, some living in fresh waters.

Ophiocara ophicephalus
macrolepidotus
Eleotris fusca
Asterropterix semipunctatus
Hypseleotris cyprinoides

GOBIIDAE

The gobies differ from the guavinas in the ventrals united and their usually smaller size. Abundant about reefs and coral.

Gobiodon rivulatus
citrinus
Paragobiodon echinocephalus
Glossogobius giuris
Gobius ornatus
Bathygobius fuscus
Chonophorus ocellaris
Rhinogobius nebulosus
Oplopomus oplopomus
Periophthalmus koelreuteri

ECHENEIDAE

The remoras have the upper surface of the head with a modified adhesive disk, with which they attach to large floating objects or fishes. All are pelagic.

* Echeneis remora
* Leptecheneis naucrates
* Remoropsis brachyptera

PARAPERCIDAE

Elongate scaly fishes, with few species. The ventrals jugular and the soft vertical fins of most extensive, the dorsal preceded by a few short spines.

Parapercis hexophthalma

BLENNIIDAE

The blennies are small carnivorous shore fishes. Many live in rock pools and near the shore.

Petroscirtes elongatus
mitratus
tapeinosoma
Salarias saliens
fasciatus
fuscus
marmoratus
Salarias edentulus
periophthalmus
dussumieri
meleagris
lineatus
unicolor

CARAPIDAE

The pearl fishes are small, very slender, transparent, commensal in holothuria.

Carapus homei
Jordanicus gracilis

BALISTIDAE

The trigger fishes are rather large shore species, covered with rather large rough scales or scutes and front dorsal of several spines though front one greatly largest.

Abalistes stellaris
Canthidermis maculatus
Balistes chrysopterus
capistratus
bursa
conspicillium
ringens
fuscus
Balistes flavimarginatus
Balistapus aculeatus
rectangulus
verrucosus
undulatus
Melichthys buniva
Odonus erythrodon

MONACANTHIDAE

The file fishes differ from the trigger fishes in having a single dorsal spine and a rough velvety skin.

Cantherines sandwichiensis
pardalis
Amanses scopas
Oxymonacanthus longirostris
Pseudaluteres nasicornis
Alutera scripta
monoceros

OSTRACIIDAE

The trunk fishes are incased in a bony carapace of firmly united polygonal plates. They are bottom dwellers in shallow waters.

Ostracion cubicus
sebae
lentiginosum
Ostracion cornutus
diaphanus
fornasini

TETRODONTIDAE

The puffers are sluggish, when disturbed fill the belly with air and then float at the surface.

* Sphoeroides lagocephalus
sceleratus
hypselogenion
Tetrodon immaculatus
Tetrodon mappa
stellatus
hispidus
nigropunctatus

DIODONTIDAE

The porcupine fishes are moderately inflatable, covered with two or three rooted spines. Bottom dwellers of sluggish habit.

Diodon hystrix
Diodon holocanthus

MOLIDAE

The head fishes are pelagic, reaching a very large size, apparently formed with a great head to which fins are attached.

Mola mola
Masturus lanceolatus
Ranzania truncata

ANTENNARIIDAE

The frog fishes have smooth or prickly skin, the very oblique mouth superior and the pectoral fin with an elbow-like angle. Pelagic, often in floating seaweed.

Antennarius commersonii
bigibbus
Antennarius hispidus
Histrio histrio

EXPLANATION OF FIGURES AND PLATES

Most of the text figures here presented were drawn by me, but a few were made under my direction by Miss Helen Gotschall and Mr. George Mac Reynolds. Figures 10-12, 18-20, 34, 41, 42, 51 and 63, reproduced from blocks used in printing my earlier papers, lack the numbers indicating the length of the line used as a scale. In all of these, the line represents 1 inch, or 2.5 millimeters. Most of the illustrations shown in Plates I-XLIX are reproductions of colored casts in Bernice P. Bishop Museum, made by the late John W. Thompson. Though painted with great care and true to nature, many small features and most of the color shading are but imperfectly represented in the monotones.

EXTERNAL CHARACTERS OF FISHES

The external characters of fishes are indicated in figure 1.

The body of a fish is typically ellipsoid or spindle-like, usually more or less compressed laterally. Exceedingly diverse modifications are the greatly elongated slender bodies of such forms as eels, sauries, bill-fishes, half-beaks, trumpet fishes, and the extremely short body of the *Monodactylus,* in which the body may be deeper than long. The divisions of the body are the head, trunk, and tail. In many forms the body consists of the trunk and tail combined, and in many only the head may be differentiated. The body of rays is usually termed a disk.

The gill opening is formed under or behind the back part of the head. In most species it is cleft obliquely forward toward the chin but in some, for example certain eels, it is simply a minute lateral pore. In sharks and rays the gill openings are formed as several vertical slits along each side of the pharynx. In bony fishes the support of the gill opening on the under surface of the head is known as the isthmus. Within the gill opening of bony fishes are typically the four gill arches and on some a modified fifth. On each gill arch are the highly vascular respiratory organs, or gill filaments, and in front the variously modified osseous points or tubercles known as the gill rakers,

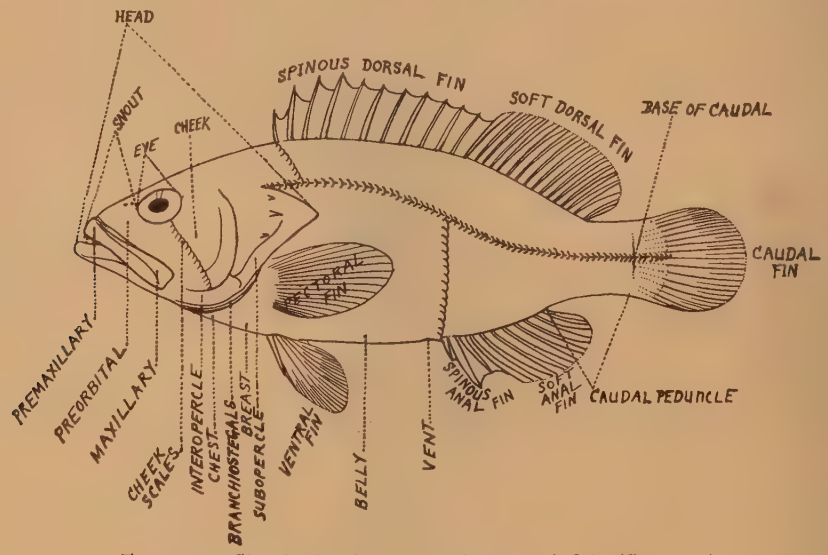

FIGURE 1.—Sketch showing external parts of fish *(Serranus).*

The head of a fish includes most of the characters used in the descriptions. Its variations are great, as may be seen by comparison of the long rapier-like rostrum of the sword fishes with the shapeless monstrosity of *Synanceja.* It may be minute as in the sea horses or enormous as in the anglers or lophiids. Its position in most fishes is terminal, though it may be superior as in many silversides and star-gazers; or inferior, as in most sharks and rays. The jaws may be greatly protractile, as in the gerrids and such labrids as *Epibulus.* Lips are usually developed, especially in labrids and gobies. In most fishes the maxillary is found more satisfactory for comparisons than is the mouth cleft. The head of many bony fishes have various armature of spines, or the preopercles, opercles, and infraorbitals may be serrated.

which for many fishes are of great importance in the distinction of species. In most fishes they are located on the upper and lower branches of the arch.

The hyoid apparatus forming the basic structure of the gills is greatly complicated in many fishes. The hyoid arches diverge from the under side of the tongue and the outer or external elements are covered with the branchiostegal membrane. In many bony fishes this is well developed and supported by one or several branchiostegal rays.

The outer covering or skin of the body of a fish is known as the epidermis and the inner layer as the dermis. The epidermis is nonvascular and may be soft and delicate as in lampreys, most cat fishes, and eels; or it may be modified into various overlapping scales, as in most fishes. The scales may have the struc-

ture of true bone, as in various armored catcatfishes and sturgeons.

In sharks and rays the little points or tooth-like structures of shagreen most likely represent the primitive exoskeleton. In most sharks they cover the body and fins, and in general are larger and better developed on the upper surface of the body. Their variation is great and in many fish their structure affords characters of value in establishing species, genera and even families. Though largely minute and requiring the aid of a lens, many are strikingly beautiful so that collections of shagreen are often made by enthusiastic microscopists. Those of the rays are seldom so ornate, simply forming large spines or bucklers.

The scales are developed in pockets and pouches of the dermis, each scale having its free posterior portion furnished with an epidermic covering. Smooth scales with unbroken edges are known as cycloid and those with their free edges furnished with a series

a *b* *c*

FIGURE 2.—Sketch showing scale structure: *a*, finely ctenoid scale of *Lethrinus; b*, cycloid scale of *Hepsetia; c*, cycloid scale of *Elops.*

of comblike spines are called ctenoid. (See fig. 2.) Some scales are represented merely by dermal tooth-like structures, as in *Chilomycterus* and *Diodon*. The trunk fishes represent species which have more or less completely cuirassed bony plates. The concentric rings or striae on the scales in most bony fishes are a clue to age. The lateral line is typically a lateral canal from the head and represents a lateral sensory system. Its importance in taxonomy arises largely from the fact that it extends from the head to the base of the tail as a series of consecutive tubes, medianly along the side of the body. In most fish, a single tube occurs on a scale, though in some, the tubes are large and much fewer than the number of lateral scales.

The fins are the most characteristic external organs of a fish, as in no other animals have they been so perfected. They may be grouped as median and paired fins. Often the median fins are called the vertical or unpaired fins. They are the most primitive and are the only ones found in the lowest vertebrates—the lancelets and lampreys. Detached median fins have been explained as originally part of a fold along the median line of the back and around the tail forward to the vent. In primitive fishes, or those with persistent larval characters, these conditions have been found. The detached fins of the back may be formed as one, two or three separate dorsal fins. They may form separated finlets as in sauries and mackerels. Similarly on the lower surface of the body the fin may break into one or two anal fins. That part of the fold remaining at the end of the tail is called the caudal fin.

The paired fins are likewise explained as elements of a lateral fold, originally formed along each side of the body from the head to the vent. When only the front and hind parts remain, they are known as the *pectoral fins* and *ventral fins* respectively. The pectorals, located close behind the head, are absent in only a few fish. The ventrals are present in many, though varying greatly in location. Those near the junction of the trunk and tail or immediately in front of the vent are termed abdominal. When forward, or below the pectorals, they are called thoracic; and when in front the ventrals or at the throat, jugular. In all fins the fin rays may be developed as spines or as soft rays, or both.

METHOD OF DESCRIPTION

HEAD

The length of the head, called "head" in descriptions, is measured from the tip of the snout to the hind edge of the opercle. The numerals given indicate the number of times it is contained in the length of the fish from the tip of the snout or mandible, accordingly as either may protrude, to the base of the caudal. The base of the caudal is determined not by the last scales on the caudal fin but by the bases of the fin rays or the last caudal vertebra. The width of the head is measured at its widest part, with reference to the total length of the head.

The snout is measured from the tip of the upper jaw to the eye, with reference to the head length from the tip of the snout.

The eye diameter, called "eye" in the descriptions, is measured across its horizontal diameter, as its form is not always circular. The number of times it is contained in the head is given, with reference from the snout tip.

The length of the upper jaw, given as "maxillary" in descriptions, is measured from the snout tip to the hind end of the maxillary. It is also computed in the head from the snout tip. As the maxillary widens posteriorly (or may even have a small superior bone developed, the supplementary maxillary), this portion is called its "expansion" and is transversely computed at its greatest width as to the number of times it is contained in the eye. In some fishes, as certain eels, where the maxillary is not very distinct externally, the mouth is measured from the snout tip to its hind corner of the rictus, or may be called the gape or mouth cleft. In gerrids or labrids, with greatly protractile jaws, the mouth is measured as retracted.

The teeth are described with reference to their structure and arrangement, in the jaws and on the palate and tongue. Details of the vomerine and palatine groups may be especially noteworthy.

The interorbital space or width is measured horizontally on top of the head between the eyes. It is computed in the head as measured from the snout tip. In some fishes, as in many sculpins and their allies, the nostrils deserve special mention and likewise the spines on the head.

The gill rakers are very often of importance. They are counted on the first arch, both above and below the bend or angle which is indicated by a plus sign. Thus 10+20 would indicate 10 on the upper branch and 20 on the lower branch, including rudiments. Sometimes the rudiments may be indicated as 2 above and 5 below, so the same count would be expressed 11, 8-15, v.

BODY

The term "length" used at the end of descriptions refers to the entire length of the fish from the tip of the snout to the posterior tip of the caudal fin. The depth of the body is the vertical distance through its deepest point, usually at the back part of the head or near the front of the dorsal. It is computed as contained in the length of the fish from the tip of the snout or mandible to the base of the caudal.

The length of the caudal peduncle (usually of the tail), is measured from behind the base of the last ray of the anal fin to the caudal base. Its depth is measured at its narrowest or most slender point and the number of times it is contained in the total head length is given. The upper profile is the usual curved line from the tip of the snout to the front, often called "origin," of the dorsal fin.

On the scales of some bony fishes the concentric rings or striae, often called circuli, are alleged to be a clue to age. Also important in many fishes as specific distinctions are the basally radiating, or marginal striae, so that counts of these are frequently given. Where the ctenoid pattern obtains, the count of marginal denticles and transversely their basal segments, or elements, are equally useful. (See figure 2.)

LATERAL LINE

In measuring the lateral line the count is made from the beginning of the line on the head to the base of the caudal fin at the last caudal vertebra. Any other scales counted out over the base of the caudal fin are indicated by a plus sign. The scales are also counted above the lateral line, usually to the point of insertion of the dorsal fin. Below the lateral line the scales are counted vertically to the insertion of the anal fin. Another equally important scale count is the number of scales on the predorsal region or in front of the dorsal fin as far forward as they may extend. In fishes with several lateral lines, as some soles, the median is counted. The number of rows of scales on the cheek is often important, espe-

cially in the parrot fishes. These are counted obliquely from the eye to the angle of the preopercle edge; or, if they extend only to the preopercle ridge, to its angle.

FINS

The various fins are expressed in the descriptions by a formula. Thus capitals, as D, A, P, V, C, refer to dorsal, anal, pectoral, ventral, and caudal respectively. Only the first two are largely used. As the fin spines are important, they are expressed in Roman capitals. In soft rayed fishes the small Roman capital first indicates a simple or rudimentary ray; and the last small capital, a rudimentary division of the last branched ray or that the ray is split or divided to its base. Thus in minnows, D. III, 7, I, indicates the dorsal fin to have 3 rudimentary or simple rays and 7 branched rays with the last ray split as 2 rays. In percoids, D. X, 18, I indicates 10 spines and 18 branched rays with the last ray split as 2 rays. If the dorsals are separated, a dash is placed after the indication of spines which shows that the spinous and rayed portions are entirely distinct. In scombroids the formula VIII-I, 11+5, shows that the dorsals are distinct with the second or soft dorsal with a spine anteriorly so the plus sign indicates a posterior separation with 5 detached finlets.

COLOR

The colors as described in this paper pertain to specimens preserved in alcohol except where otherwise stated.

TERMINOLOGY

Abdominal fins. Ventral fins when placed well behind the pectoral fins and the pelvic arch, to which they are attached but not connected with the shoulder girdle.

Accessory pectoral scale. An enlarged or elongated scale at the base of the pectoral fin, found in many herrings, anchovies and gray mullets.

Actinosts. A series of bones at the bases of pectoral rays. Also called brachial ossicles.

Adipose eyelid. Broad fatty eyelid, covering most of the eye in such fishes as *Elops*, many gray mullets, mackerels, crevalles, and thread fishes.

Adipose fin. Fleshy fin-like projection on the back behind the dorsal fin, as in the lizard fishes, and many scopelids. Also called adipose dorsal.

Air bladder. A sac filled with air placed below the backbone, corresponding to the lungs of higher animals. Also called air vessel, and swim bladder.

Anal. Refers to the vent or anus.

Anal fin. Fin on median line of body behind vent.

Anal papilla. A fleshy projection at the vent, some bilobed, in some blennies branched or dendrite.

Antrorse. Turned forward, usually with reference to barbs on spines or fins.

Articulate. Jointed, refers to rays in distinction to spines which are entire.

Barbel. Long, slender, fleshy points, about the mouth of most catfishes; a pair at chin in the goatfishes.

Bathypelagic. Distinguishes fishes usually widely distributed in the great depths of the ocean.

Bicuspid. Two-pointed, usually refers to teeth.

Body. The whole fish—head, trunk, and tail.

Branchiostegals. Bony rays supporting membranes under the head below the opercular bones. Mostly used in determining generic or family characters.

Buccal. Relating to the mouth.

Caducous. Soon falling off, as the delicate scales on many small herrings, and anchovies.

Caecum. Blind sack-like appendage connected with the alimentary canal at the posterior end of the stomach.

Canines. Any conical teeth in jaws larger or longer than the others.

Cardiform. Refers to slender teeth set closely like those of a card.

Carinate. Keeled, usually with reference to a ridge along median line.

Caudal fin. Fin at or on the tail.

Caudal peduncle. Region between anal and caudal, and dorsal and caudal, fins.

Centrum. Body of a vertebra.

Cephalic fin. Detached part of pectoral fin on the head of certain rays.

Chiasma. Crossing of the optic nerve fibers.

Chin. Space at front of lower jaw.

Cirri. Fringes, usually smaller structures than barbels.

Claspers. Male reproductive organs attached to the ventral fins of sharks, skates, rays, and chimaeras.

Compressed. Flattened from one side to the other, as in most fishes.

Ctenoid. Usually refers to scales with rough edges, due to being minutely spinous or pectinated.

Cycloid. Usually refers to scales with smooth edges, not ctenoid, but concentrically striate.

Deciduous. Falling off or temporary. See **Caducous.**

Dentate. With tooth-like notches.

Denticle. A little tooth. Denticulate.

Depressed. Flattened vertically, as in all skates, rays, and flatheads.

Depth. Usually refers to vertical diameter of body.

Dorsal. Relating to the back.

Ectopterygoid. One of a pair of bones on the roof of the mouth.

Emarginate. Slightly forked or notched, especially with reference to the caudal fin.

Enteron. Alimentary canal.

Entopterygoid. One of a pair of bones on the mouth roof behind the ectopterygoids.

Exoskeleton. Outer skeleton, or such hard parts of the body surface as scutes and scales.

Exserted. Projecting beyond the general level.

Falcate. Sickle-shaped, often with reference to the pectoral fin. Falciform.

Filiform. Thread-form. Filamentous.

Fontanel. An unossified space, as the top of head covered by membrane.

Forehead. Frontal curve of head. Often called frontal region.

Fossae. Usually grooves in which nostrils open.

Furcate. Forked.

Fusiform. Spindle-shaped, or tapering at both ends.

Gape. Opening of the mouth. Mouth cleft.

Gill arches. Bony arches to which gills are attached.

Gill membranes. Thin wall of skin supported by the branchiostegals and closing gill openings below.

Gill opening. Opening under or behind back part of head, usually cleft obliquely forward toward chin, on some fishes, as certain eels, simply a minute lateral pore. In sharks and rays the gill openings are formed as several vertical slits along each side of the pharynx.

Gill rakers. Variously formed bony appendages along the inner edge of the gill arch. Vary from long and exceedingly numerous bristles as in menhaden and mackerel, to a few blunt rudiments, or entirely absent.

Granulate. Finely roughened.

Gular. Relating to the upper foreneck.

Haemal spine. Lowermost spine of a caudal vertebra.

Heterocercal. Unequally lobed tail with backbone evidently extending into the upper lobe.

Homocercal. Equally lobed tail with backbone stopping at middle of base of caudal.

Hyoid. Relating to the tongue.

Hypural. Modified last vertebra, some expanded, supporting caudal fin.

Imbricated. Overlapping, like shingles on a roof.

Infraoral. Below the mouth.

Infraorbitals. Arch of small bones along lower edge of eye.

Interopercle. Membrane bone attached between preopercle and branchiostegals.

Interorbital. Space between the eyes, sometimes called interorbital width, especially when eyes protrude or extend within the area of the interorbital laterally. Firm or bony portion between the eyes called bony interorbital.

Isocercal. Refers to a tail of which the last vertebrae are graduated smaller and end in median line of caudal fin as in gadoids.

Isthmus. Support of chest with the throat; usually between the branchial cavities.

Jugular. Relating to the lower throat. Usually with reference to ventral fins inserted in advance of the pectorals, as in blennies.

Larva. An immature form which must undergo change of appearance before becoming adult, as in many eels.

Lateral line. A series of muciferous tubes along each side of the body forming a raised line.

Lunate. Form of new moon or crescent-shaped. Usually refers to a broad and shallow forked caudal lobe as in porbeagles and mackerels.

Mandible. Lower jaw.

Maxillary. Upper jaw. Often called the maxilla. Technically the outermost or hindmost bones of the upper jaw.

Milt. Testes.

Molars. Grinding teeth, usually posterior in the jaws as in the porgies.

Muciferous. Producing or containing mucous.

Muzzle. Front part of the head, including snout, preorbital, maxillary and entire under jaw.

Nape. Neck above, next to the occiput.

Nares. Nostrils. Uusually 2, rarely 1, each side of snout.

Neural spine. Uppermost spine of a verterbra.

Nictitating membrane. Third or inner eyelid, as in sharks.

Occipital. Relating to the occiput or back of the head above.

Ocellate. Eye-like, usually roundish with a lighter or darker border.

Opercle. Back membrane bone on side of head covering branchial cavity. Operculum.

Orbit. Bony eye socket.

Oviparous. Producing eggs developed after exclusion from the body, as in most fishes.

Ovoviviparous. Producing eggs hatched before exclusion from the body, as in dog-sharks.

Palate. Roof of the mouth.

Palatines. Pair of membrane bones on mouth roof, one each side extending out band from vomer.

Papilla. A small fleshy projection.

Parietal. Bone on each side of head above.

Pectinate. Toothed like a comb.

Pectoral. Relating to the breast.

Pectoral fins. Front or upper paired fins, corresponding to front limbs of other vertebrates.

Pelagic. Living in or on high seas.

Pelvic girdle. Bones supporting ventral fins.

Pelvis. Bones to which hind limbs or ventral fins, are attached.

Peritoneum. Membrane lining abdominal cavity.

Pharyngeal bones. Bones behind gills at beginning of oesophagus, of various forms, generally with teeth. In most fishes placed as a single pair below and a double pair above.

Pharyngognathous. With lower pharyngeal bones united.

Photophore. Small external luminous spot or body, as in scopelids.

Physostomous. With air bladder connected by a tube with the alimentary canal.

Plicate. Folded, so as to show transverse folds or wrinkles.

Plumbeous. Lead-colored, dull bluish-gray.

Postocular. Behind eye. Postorbital.

Premaxillaries. Bone on each side of front of upper jaw, generally larger than maxillaries and bearing most of teeth.

Premolars. Small grinders, or teeth, between canines and true molars.

Preocular. Before eye.

Preopercle. Membrane bone lying in front of opercle, more or less parallel.

Preorbital. Usually large membrane bone before eye.

Projectile. Capable of being thrust forward.

Protractile. Capable of being drawn forward.

Proximal. Nearest, usually basal.

Pseudobranchiae. Small gills in inner side of opercle but not functioning as gills.

Pubic bones. Pelvic bones.

Pyloric coeca. Glandular appendages formed as blind sacs, opening into alimentary canal at pylorus or junction of stomach with intestine.

Quincunx. Set of 5 arranged :·:

Ray. Cartilaginous rod supporting membrane of fin.

Recurved. Curved upward.

Reticulate. Marked like a network.

Retrose. Turned backward.

Roe. Ova.

Rugose. Rough with wrinkles.

Scapular arch. Shoulder girdle.

Scute. External bony or horny plate.

Second dorsal. Posterior or soft part of a dorsal fin when the two parts are separated.

Septum. A thin partition.

Serrate. Notched like a saw.

Sessile. Without a stem.

Setaceous. Bristly.

Setiform. Bristle-like.

Shoulder girdle. Bony girdle back of head forming attachment for front limbs.

Soft dorsal. Posterior part of dorsal fin when composed of soft rays.

Soft rays. Articulating rays of fin, usually branched.

Spatulate. Spoon-shaped.

Spine. A sharp projecting point. When in fin usually unbranched, inarticulate and more or less stiff and sharp pointed.

Spinous dorsal. Front part of dorsal fin when composed of spinous rays.

Spiracles. Openings in head and neck, as in sharks and skates.

Stellate. Star-like, or with radiating ridges.

Striate. Striped or streaked.

Subcaudal. Lower lobe of tail as in many sharks.

Subopercle. Bone below opercle, suture of connection hidden by scales.

Suborbital. Below eye.

Suborbital stay. Bone extending from one of suborbitals across the cheek towards preopercle, as in sculpins, gurnards and flat-heads.

Subulate. Awl shaped.

Superciliary. Relating to above the eyebrow.

Supplementary maxillary. Small bone along upper edge of maxillary.

Supraoral. Above the mouth.

Suprascapular. Post-temporal, or bone joining shoulder-girdle with skull.

Suture. Line of union of two bones.

Symphysis. Point of junction of two parts, of lower jaw as tip of chin.

Tail. Generally part of body posterior to the anal fin, some posterior to the vent.

Temporal. Relating to the temples.

Terete. Cylindrical and tapering.

Tessellated. Marked with little checks or squares like mosaic work.

Thoracic. Relating to the chest.

Thoracic fins. So called when attached immediately below the pectorals, as in groupers and snappers, the pelvic bones being fastened to the shoulder girdle.

Trenchant. Compressed to a sharp edge.

Truncate. Abrupt, cut square.

Tubercle. Small excresence like a pimple.

Ultimate. Last or farthest.

Vent. Anus.

Ventral. Relating to the abdomen.

Ventral fins. Paired fins below or behind pectorals corresponding to the hind limbs of other vertebrates.

Ventral plates. Row of plates along belly between throat and vent.

Versatile. Capable of being turned either way.

Vertical fins. Fins of the median line of the body as the dorsal, anal and caudal.

Villiform. Usually of slender crowded teeth in velvety bands.

Viscous. Slimy.

Viviparous. Bringing forth living young.

Vomer. Bone immediately behind maxillaries in front part of roof of mouth.

NEW NAMES

The following new subgeneric and specific names are proposed in the body of this work as follows:

Muraenichthys cookei, new species: in Echelidae (p. 41).

Rhynchorhamphus, new subgenus: in Hamiramphus (p. 75).

Cookeolus, new subgenus: in Priacanthus (p. 190).

Scaridea octodon, new species: in Callyodontidae (p. 369).

Blennius snowi, new species: in Blenniidae (p. 431).

Salarias beani, new species: in Blenniidae (p. 441).

DESCRIPTION OF SPECIES

BRANCHIOSTOMIDAE

Epigonichthys caudatus (Willey).

Asymmetron caudatus Willey: Quart. Jour. Micros. Sci., London, vol. 39, p. 219, pl. 13, 1896 (type loc., Louisiades).

Amphioxides pelagicus (Günther).

Branchiostoma pelagicum Günther: Rept. voyage "Challenger," vol. 31, pt. 2, p. 43, pl. 6, fig. B, 1888 (1889) (type loc., N. Lat. 23° 3′, W. Long. 156° 6′ [a few degrees northeast of Honolulu]).

? *Amphioxus lanceolatus* (non Pallas) Schmeltz: Mus. Godeffroy, Cat. 4, p. 29, 1869; Cat. 5, p. 41, 1874 (Viti Islands).

The species *Eptatretus cirrhatus* (Schneider) from New Zealand is not admitted. It is described as *Bdellostoma heptatrema* by Müller (Akad. Wiss. Berlin, Abhand., p. 79, 1934) as from the "South Sea." Müller's account is based on Home (Philos. Trans., pl. 12, fig. 1, 1815).

SCYLIORHINIDAE

Apristurus spongiceps (Gilbert).

Catulus spongiceps Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 579, 1903 (1905) (type loc., Bird Island, in 313 to 800 fathoms).

Jordan and Jordan (Carnegie Mus., Mem., vol. 10, no. 1, p. 3, Dec., 1922) remark, "this species is referred by Garman to *Pristiurus,* which genus is characterized by a row of prickly scutes along the upper side of the tail. These are not present in Gilbert's type, though perhaps they may have been lost in the dredge."

Ateleomycterus marmoratus (Bennett).

Scyllium marmoratum Bennett: Life of Raffles, p. 693, 1830 (type loc., Sumatra).

Scyllium maculatum Bleeker: Soc. Ind. Neerl., Act. no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).

Differs from *Apristurus spongiceps* in the short narrow snout, the anterior nasal valve reaching the mouth, the absence of a posterior nasal valve and the short anal and subcaudal lobes.

Possibly *Chiloscyllium griseum* Müller and Henle is intended in the few lines given by Montrouzier (Fauna Woodlark, p. 220, 1857) under *Scyllium.* Nasal lobes prolonged in barbels; fifth gill opening very close to the fourth and almost hidden by them; skin very rough; anal placed behind the second dorsal; color ash-gray. The teeth support a stiff bulge, moreover as it exceeds two feet in length, this would indicate the species attains a large size. He mentions that though Montrouzier has not sent the drawing of this shark, it probably belongs with *Chiloscyllium.*

India and East Indies.

ORECTOLOBIDAE

Hemiscyllium ocellatum (Bonnaterre).

Squalus ocellatus Bonnaterre: Tableau ichth., p. 8, 1788 (type loc., South Sea).

Chiloscyllium ocellatum Günther: Cruise of "Curacoa," p. 409, 1873 (Solomon Islands).—Macleay: Linnean Soc. New South Wales, Proc., vol. 7, p. 597, 1882 (New Guinea).—Regan: Zool. Soc. London, Proc., p. 359, 1908 (Solomons).—Günther: Mus. Godeffroy, Jour., vol. 17, pt. 9, p. 488, 1910 (Solomons).

Three specimens from New Guinea, two of which labeled Port Moresby, in the National Museum. The largest is 670 mm. long. I also compared a smaller specimen from Port Jackson, which agrees. The New Guinea specimens were wrongly identified as *Hemiscyllium trispeculare* Richardson. They do not show the broad cutaneous flap to the lower jaw, the lower lip being free only at each side and leaving a broad median frenum. They have a round dark blotch above and behind the pectoral axil, bordered with white. Two rows of dark brown blotches appear along each side of the body, but there are no fine spots over the upper surface. The dark crossbands on the head and trunk obscure. Both dorsals with two dark spots on the front of each fin. The first dorsal is entirely behind the ventral bases.

Australia, East Indies, Solomon Islands.

Hemiscyllium freycineti (Quoy and Gaimard).

Scyllium freycineti (Cuvier) Quoy and Gaimard: Voyage "Uranie," Zool., p. 192, 1824 (type loc., Waigiu).—Garman: Mus. Comp. Zool., Mem., vol. 36, p. 46, 1913 (Waigiu).

Chiloscyllium freycineti Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 96, 1913 (Saonek).

Scyllium melaisianum Lesson: Voyage "Coquille," vol. 2, pt. 1, p. 94, pl. 6, 1830 (type loc., Offack Bay, Waigiu).

Chiloscyllium malaianum Dumeril: Rev. Mag. Zool., p. 125, 1853 (types).—Dumeril: Hist. nat. Elasmobr., vol. 1, p. 332, 1865 (types).

Differs from *Hemiscyllium ocellatum* in the absence of a large ocellated spot above the pectoral, though a dark spot is present above each pectoral base.

Orectolobus maculatus (Bonnaterre).

Squalus maculatus Bonnaterre: Tableau ichth., p. 8, 1788 (type loc., South Sea).

Crossorhinus barbatus Schmeltz: Mus. Godeffroy Cat. 4, p. 28, 1869 (South Sea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 547, 1882 (New Guinea).

Both *Orectolobus maculatus* and *Eucrossorhinus dasypogon* have dermal lobes, though in the latter they are more numerous and branching below the lower jaw. They also differ from *Ginglymostoma ferrugineum* in the short tail and short caudal fin.

Australia and East Indies.

Eucrossorhinus dasypogon (Bleeker).

Crossorhinus dasypogon Bleeker: Arch. Neerl. Sci. Nat., vol. 2, p. 400, pl. 21, fig. 1, 1867 (type loc., off Waigiu; Aru).—Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 298, 1868 (Waigiu).

Eucrossorhinus dasypogon Regan: Zool. Soc. London, Proc., p. 357, 1908 (type, Waigiu).

Distinguished by its greatly branched tentacles on the side of the head from the nostril to the gill opening. Length 800 mm.

East Indies.

Ginglymostoma ferrugineum (Lesson).

Scyllium ferrugineum Lesson: Voyage "Coquille," vol. 2, pt. 1, p. 95, 1830 (type loc., Port Praslin, New Ireland; Offack Bay, Waigiu).

Ginglymostoma mulleri Schmeltz: Mus. Godeffroy, Cat. 6, p. 18, 1877 (Samoa).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 487, 1910 (Samoa).

Ginglymostoma concolor (non Rüppell) Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 597, 1882 (New Guinea).

Nasal cirrus hardly reaches teeth. Angles of fins pointed. Subcaudal feebly lobed. Length 2584 mm.

India and East Indies to Samoa.

RHINEODONTIDAE

Rhineodon typus Andrew Smith.

Rhincodon typus Andrew Smith: Zool. Jour., vol. 4, p. 443, 1829 (type loc., Table Bay, South Africa).—Garman: Mus. Comp. Zool., Mem., vol. 36, pp. 42, 456, 1913 (tropical Pacific).

Rhinodon typicus Günther: Mus. Godeffroy, Jour., vol. 17, pt. 9, p. 486, 1910 (Pacific Archipelago).

Selache maxima (non Gunner) J. Thomas: Cannibals and convicts experience, western Pacific, p. 380, 1887 (Red Scar Bay, southern New Guinea).

Among the largest of fishes. Distinguished by its broad snout, numerous and minute teeth, small spiracles, tail and body with lateral folds or keels and the long caudal little raised. Marked with white vertical lines between which many small scattered white spots.

Tropical and temperate seas.

ISURIDAE

Carcharodon carcharias (Linnè) (fig. 3).

Squalus carcharias Linné: Systema nat., 10th ed., p. 235, 1758 (type loc., Europe).—Lichtenstein: Descriptiones animalium, Forster, p. 256, 1844 (Tanna).—Kittlitz: Denkw. Reise Mikronesien, vol. 2, p. 188, 1858 (Bonin Islands).—Jouan: Soc. Cherbourg, Mem., vol. 8, p. 245, 1861 (New Caledonia).

Carcharodon carcharias Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 44, 1903 (1905) (Poona [Puna], Hawaii).

FIGURE 3.—Sketch of *Carcharodon carcharias.*

Carcharodon rondeletii Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 485, 1910 (between Polynesia and western South America).

Jouan says that the species is common on the coasts and in the bays of New Caledonia. Implements made by Hawaiians from the teeth of this shark are in Bernice P. Bishop Museum.

Tropical and temperate seas.

Isurus glaucus (Müller and Henle).

Oxyrhina glauca Müller and Henle: Beschr. Plagiostomen, p. 69, pl. 29, 1841 (type loc., Java).

Isuropsis glauca Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 43, fig. 5, 1903 (1905) (Honolulu).

Lamna glauca Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 484, 1910 (compiled).

Head about 4 in total length without caudal. Snout conic, slender, ends in distinct point. Gill opening about long as snout. First dorsal origin near vertical from inner end of pectoral, front edge convex; base about two-thirds its height; fin about long as high. Second dorsal very small, well posterior. Pectoral width little less than half its length, hind edge slightly concave.

Back blackish-brown, sharp line of demarcation from snout tip above eye, including upper portion of gill openings and then along caudal keels. Caudal, pectoral and ventral blackish like back. Eye dark.

The specimen described, 1646 mm. long, was brought to the Honolulu market in 1917. Three reported since. The shark flesh most esteemed by the Japanese.

Jouan describes a young male, likely of this species, as *Lamna* (Soc. Sci. Nat. Cherbourg, Mem., vol. 8, p. 245, 1861) from Kanala, New Caledonia:

Snout very pointed; upper teeth recurved inside and outside; lower teeth erect; gill openings 5, last very little behind pectoral origin; no spiracle; first dorsal little pointed; upper caudal lobe more than a third of the total length of the fish, at the origin of this lobe the upper part of the tail is almost cut transversely with a pit in form of a crescent, its convexity rounded behind: pectoral moderately long, pointed; ventral nearly rhomboidal. A young male 55 cm. (without caudal).

Distributed in the tropical and temperate Pacific.

ALOPIIDAE

Alopias vulpinus (Bonnaterre) (fig. 4).

Squalus vulpinus Bonnaterre: Tableau ichth., p. 9, pl. 85, fig. 349, 1788 (type loc., Mediterranean).

Alopias vulpes Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 939, 1904 (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 42, fig. 4, 1903 (1905) (Honolulu).

Alopecias vulpes Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 483, 1910 (compiled).

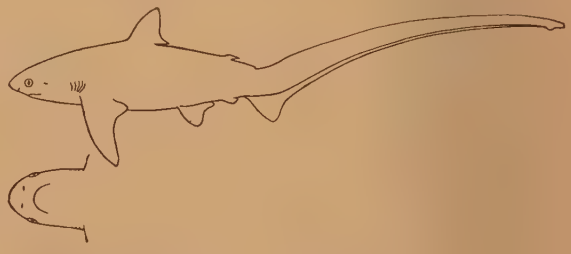

FIGURE 4.—Sketch of *Alopias vulpinus.*

A cast of a specimen taken in the Honolulu market about 1912 and since then four or five other specimens have been obtained. These were all larger than the cast, which is 2128 mm. long. One in the National Museum, obtained at Honolulu in 1902 by Berndt.

Dr. Ball tells me that specimens have been reported at Fanning Island, according to Mr. Wm. Greig.

Tropical and temperate seas of the globe.

EULAMIIDAE

Galeorhinus galeus (Linné).

Squalus galeus Linné: Systema nat., 10th ed., p. 234, 1758 (type loc., European ocean).

Galeus vulgaris Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 19, 1901 (Laysan).

Distinguished from the other genera chiefly by the presence of small spiracles. The serrated teeth are notched and oblique.

Possibly the jaws from Port de France, New Caledonia, described by Jouan under *Galeus* (Soc. Sci. Nat. Cherbourg, Mem., vol. 8, p. 245, 1861) may refer to this species:

Each jaw garnished with 40 rows of large irregularly placed teeth, flattened, denticulated upon their ascending edges. The teeth are pointed, one of the sides vertical, the exterior deeply notched in such manner to form an angle returning point. The points of the teeth are turned towards the angle of the mouth the more they approach. This dentition is characteristic of the topes. Compared with *Eulamia* of the same size they appear more elongate. Jaws 220 mm. wide.

Galeocerdo arcticus (Faber) (fig. 5).

Squalus arcticus Faber: Nat. Fische Islands, p. 17, 1829 (type loc., Iceland).

Galeocerdo arcticus Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 4, 1925 (Laysan, Nihoa, Lisiansky, Gardner islands).

Galeocerdo rayneri Ogilby: Cat. Fish New South Wales, p. 1, 1886 (Solomon Islands).

Galeocerdo tigrinus Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 940, 1904 (Oahu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 36, 1903 (1905) (Honolulu).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 483, 1910 (Hawaii).

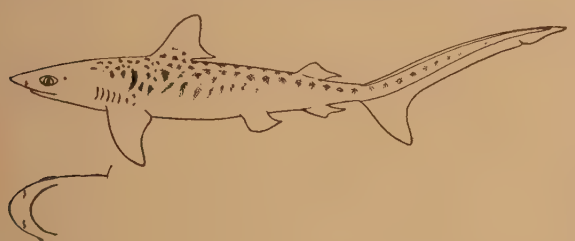

FIGURE 5.—Sketch of *Galeocerdo arcticus*.

A small specimen obtained for the Bishop Museum in Honolulu market in 1916. Coloration mottled or striped, as shown by Müller and Henle. Tooth from specimen at Laysan and entire jaw in Bishop Museum from specimen from Nihoa.

Tropical and temperate seas to 70° or more from the equator.

Glyphis glaucus (Linné).

Squalus glaucus Linné: Systema nat., 10th ed., p. 235, 1758 (type loc., European ocean).

Prionodon glaucus Schmeltz: Mus. Godeffroy, Cat. 4, p. 28, 1869 (Pacific Ocean).

Prionace glauca Snyder: U. S. Fish Comm., Bull., vol. 22, p. 515, 1902 (1904) (N. Lat. 28° 31′, W. Long. 141° 47′).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 4, 1922 (Hawaii).

Jordan and Jordan state "a cast in the Bishop Museum shows the pectoral fin rather longer than in the Atlantic *Prionace glauca*. A specimen taken by the *Albatross* agrees with this, the pectoral being 4.5 in total length, instead of 6.25." The cast referred to is from a specimen 2730 mm. long, brought to the Honolulu market about 1918. The comparison is hardly valid, as the specimen described was empty and not in normal condition, as may be observed from the thin or rather lean appearance, even in the cast.

In examining a large series of half-grown and young, obtained by the *Albatross* in the Hawaiian region, now in the National Museum, I could not find that they differ in any way from other Pacific and Atlantic specimens of *Glyphis glaucus*.

Tropical and temperate seas of globe.

Eulamia limbatus (Müller and Henle).

Carcharias (*Prionodon*) *limbatus* Müller and Henle: Beschr. Plagiostomen, p. 49, pl. 19, fig. 9 (teeth), 1841 (no type locality).—Steindachner: Akad. Wiss. Wien, Sitzs., vol. 115, pt. 1, p. 1425, 1906 (Upolu).

In *Eulamia limbatus* and *Eulamia sorrah* the second dorsal is smaller than the anal. In *E. limbatus* their origins are opposed, while in *E. sorrah* the anal is slightly more posterior. The first has an elongate snout; the second a moderately blunt snout.

Tropical and temperate seas.

Eulamia sorrah (Müller and Henle) (Pl. I, *A*).

Carcharias (*Prionodon*) *sorrah* (Valenciennes) Müller and Henle: Beschr. Plagiostomen, p. 45, pl. 16, 1841 (type loc., India, Java, Madagascar).

Carcharias sorrah Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 4, 1906 (Shortland Island, Solomons).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 480, 1910 (Hawaii).

Carcharias phorcys Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 163, 1902 (1903) (type loc., Honolulu).—Snyder: op. cit., vol. 22, p. 513, 1902 (1904) (Honolulu; Kanalei Bay, Kauai).—Jordan and Evermann: op. cit., vol. 22, pt. 1, p. 39, pl. 2, 1903 (1905) (type, Honolulu).

Snout moderate, length ⅔ to ⅞ its width, broadly curved on sides, end blunt. Eye moderate, orbit about equals gill openings or 1⅓ to nostril. Mouth greatly arched, width equals preoral length; very slight concealed fold at angle of mouth. Teeth in about 25 rows, all serrated; upper much wider and with coarser serrae, especially at bases. Nostrils midway in preoral length, greatest length 3/5 of eye; valves with slight pointed lobe. Scales with 4 or 5 strong ridges, though barely forming marginal serrae. First dorsal inserted little behind pectoral base, fin base 1⅓ to 1⅔ in front fin edge. Second dorsal about like anal, slightly advanced, both fins with hind edges concave. Caudal long, 2⅞ to 3 1/5 in rest of body, pointed; subcaudal lobe 2⅛ to 2⅓ in upper. Pectoral falciform, width 1⅞ to 2 in length, reach 4/5 to end of dorsal base, outer angle convexly sharp, inner edge concave.

Color in alcohol gray-brown to slaty above, paler to whitish below. All fins with darker terminally, dusky on pectoral and subcaudal lobes. Iris dark gray.

Described from a specimen 733 mm. from Shortland Island and one 633 mm. from Hono-

lulu, in the Bishop Museum. It will thus be seen that the specimens agree with Garman's description in every feature except that the anal is not twice as large as the second dorsal. In the National Museum I examined the type of *Carcharias phorcys* and four other specimens from Honolulu and Kauai. In the Honolulu market I found a half-grown specimen, December 18, 1922; and one 758 mm. long, December 21, 1922.

Ranges from Madagascar to the East Indies and Hawaii.

Eulamia melanopterus (Quoy and Gaimard).

Carcharias melanopterus Quoy and Gaimard: Voyage "Uranie," Zool., p. 194, pl. 43, figs. 1-2, 1824 (type loc., Waigiu; Mariannes).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 28, 1869 (Kandavu).—Streets: U. S. Nat. Mus., Bull., vol. 7, p. 94, 1877 (Christmas and Washington islands, Fanning group).—Peters: Akad. Wiss. Berlin, Monatsb., p. 853, 1876 (1877) (New Ireland).— Snyder: U. S. Fish Comm., Bull., vol. 22, p. 513, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 38, pl. 1, 1903 (1905) (Honolulu; Samoa).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 480, 1910, (Indio-Pacific; Hawaii).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 242, 1911 (Fakarava, Paumotu).

Carcharias (Prionodon) melanopterus Müller and Henle: Beschr. Plagiostomen, p. 43, pl. 19, fig. 5, 1841 (Waigiu).—Bleeker: Soc. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).—Dumeril: Hist. nat. Elasmobr., vol. 1, p. 365, 1865 (types).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 41, 1874 (Viti Islands).—Steindachner: Akad. Wiss. Wien, Denk., 70, p. 519, 1901 (South Sea).

Squalus melanopterus Jouan: Soc. Cherbourg, Mem., vol. 8, p. 245, 1861 (Baie de Dum 'bea, New Caledonia).

Carcharhinus melanopterus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 325, 1901 (Thornton Island).

Carcharinus melanopterus Garman: Mus. Comp. Zool., Mem., vol. 36, p. 134, 1913 (Apiang, Kingsmills).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 4, 1922 (Hawaii).

Eulamia melanopterus Fowler: B. P. Bishop Mus., Bull. 22, p. 4, 1925 (Guam).—Fowler: op. cit., Bull. 38, p. 3, 1927 (Christmas Island).

One specimen in the Bishop Museum from Palmyra Island, obtained by C. Montague Cooke, Jr., in 1913, is 532 mm. long. Another from the Honolulu market is 608 mm. long. In the Agassiz Museum I examined a small specimen from Apiang, Kingsmills, and a small partly skinned-out specimen from the Tuamotus. In the National Museum are three from Honolulu, one from Hanelei Bay, one from Fakarava and two foetal specimens from the Solomon Islands. In the Academy is a small dry skin, obtained by C. D. Voy at Thornton Island.

In describing the habits of this species in Palmyra, C. Montague Cooke, Jr., gave me the following information:

Very abundant in the lagoon at Palmyra in 1913. Sometimes as many as six to eight would be swimming around us as we waded in the lagoon, in about 6 to 18 inches of water. Most of these sharks were from two to four feet in length. I think the reason we excited their curiosity was the stirring up of the mud. On two occasions we had them follow us as we were walking on the shore line. As we waded in the water they continually circled about us, the circles gradually growing smaller. On several occasions they came close enough for us to step on their heads, when they would rush away. We caught six on lines one evening in our bathing pool on fishbait. The only specimen in the museum was a small one taken in a scoop-net, when it approached us.

Ball reports four seen at Fanning Island in July, 1922. They were called "lagoon shark" and used as food by the natives. The largest seen were perhaps six feet long, ranging down to three feet long. One from Guam, head 90 mm. long and parts of fins, obtained in 1923, in the Bishop Museum.

This species differs from all other sharks of Oceania in having black bordered fins.

From South Africa to the East Indies, Hawaii, and Tuamotus.

Eulamia menisorrah (Müller and Henle).

Carcharias (Prionodon) menisorrah (Valenciennes) Müller and Henle: Beschr. Plagiostomen, p. 46, pl. 17, 1841 (type loc., Java; Australia; Red Sea).

I have examined a male from Port Moresby, New Guinea, in the National Museum. Though agreeing with *E. melanopterus* in the second dorsal and anal fins about of equal size, in *E. menisorrah* the anal origin is advanced while in *E. melanopterus* it is about opposite that of the second dorsal. Moreover most *E. menisorrah* have pale borders on the fins.

Mauritius to the East Indies.

Eulamia gangeticus (Müller and Henle).

Carcharias (Prionodon) gangeticus Müller and Henle: Beschr. Plagiostomen, p. 39, pl. 13, 1841 (type loc., Ganges, 60 hours above the sea at Hoogly).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 519, 1901 (Laysan).

Carcharias gangeticus Günther: Cat. fishes Brit. Mus., vol. 8, p. 367, 1870 (Fiji, fresh waters Viti Levu).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 479, 1910 (Viti Levu).

Carcharhinus gangeticus Garman: Mus. Comp. Zool., Mem., vol. 36, p. 139, 1913 (Fiji).

According to Garman closely allied with *Eulamia commersonii* in the second dorsal larger than the anal and more advanced. It further differs in the very short snout, with the nostrils near the end, and the shorter pectoral. Both have broad serrated teeth.

India, East Indies, Japan, Laysan and Fiji.

Eulamia commersonii (Blainville).

Carcharias commersonii Blainville: Soc. Philom. Paris, Bull., vol. 8, p. 121, 1816 (name only).—Blainville: Fauna Francais, Poiss., p. 90, 1830 (on Lacépède).—Garman: Mus. Comp. Zool., Mem., vol. 36, p. 140, 1919 (Pacific Ocean).

Eulamia commersonii Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 4, 1925 (Kauai, Laysan, Nihoa, Gardner, and Wake islands).—Fowler: op. cit., Bull. 38, p. 3, 1927 (Jarvis Island).

Squalus carcharias (non Linné) Lacépède: Hist. nat. Poiss., vol. 1, p. 169, pl. 8, fig. 1, 1798 (no type locality).

Squalus (Carcharias) maou Lesson: Voyage "Coquille," vol. 2, pt. 1, p. 91, pl. 1, 1830 (type loc., Society Islands).

Carcharinus maou Garman: Mus. Comp. Zool., Mem, vol. 36, p. 144, 1919 (copied).

?*Carcharias leucas* Jouan: Soc. Cherbourg, Mem., vol. 9, p. 190, 1863 (between New Caledonia and Australia).

Carcharias lamia Peters: Akad. Wiss. Berlin, Monatsb., p. 853, 1876 (1877) (Pacific Ocean).—Günther: Rept. voyage "Challenger", vol. 31, p. 5, 1889 (Kermadec Group).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 481, 1910 (Kermadec Islands).

Carcharias insularum Snyder: U. S. Fish Comm., Bull., vol. 22, p. 513, pl. 1, fig. 1, 1907 (1904) (type loc., off Diamond Head; between Molokai and Oahu).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 603, 1908 (between Mary Island and Fiji).

Carcharias nesiotes Snyder, U. S. Fish Comm., Bull., vol. 22, p. 514, pl. 1, fig. 2, 1902 (1904) (type loc., French Frigates Shoal; Laysan).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 40, pl. 3, fig. 2, 1903 (1905) (Honolulu).

Snout rather attenuated, length in profile slightly less than its width. Eyes small, orbital width 2/3 of space to nostrils. Mouth large, strongly curved and very short labial fold at each outer angle. Teeth subtriangular, finely serrated; upper nearly erect, in 28 rows; lower narrower, edges nearly entire, in about 30 rows, all erect. Nostrils about last 2/5 in snout length, wide as eye measured across iris or about 3/4 of orbit. Internasal 2/3 of length of snout from front mouth edge. Gill opening about 2 1/2 times orbital diameter. Scales with 5 strong keels, usually slightly approximated towards edge, where also forming 5 small serrae. First dorsal higher than basal length, origin slightly behind pectoral base. Second dorsal small, scarcely larger than similar anal, though slightly advanced. Caudal large, 2 1/2 in rest of body; subcaudal lobe 2 1/4 in caudal length; hind edge of caudal lobe deeply indented behind. Pectoral width 1 4/5 in its length, reaches beyond dorsal base, angles rounded.

Color in alcohol grayish, with slight olive tint above. Lower surface whitish. Iris pale. Tips of all fins dusky.

The specimen described is from Honolulu, 658 mm., in the Bishop Museum. A cast in the Bishop Museum from another Honolulu specimen, 1386 mm. long, differs a little in the color of the upper surface, being uniform and without dark edges to the fins; hind pectoral edges are nearly straight; a slightly broader head and anal the size of the second dorsal. The Bishop Museum received one from Laysan 1015 mm. long, and piece of jaws with teeth of a specimen from Gardner Island. One 495 mm. long from Wake Island. In the National Museum I examined the types of *Carcharias insularum* and *Carcharias nesiotes,* besides three other specimens, paratypes. All undoubtedly belong to this species.

Lesson's plate of *Squalus* (*Carcharias*) *maou* appears to me to represent *Eulamia commersonii* inaccurately or variably. This is suggested by the pale blotches, also somewhat on the first dorsal, lower caudal lobe, ventral and anal lobes of Snyder's figure of *Carcharias insularum.*

Warmer Atlantic, Mediterranean, in Oceania from Hawaii, Society Islands, Kermadec Islands, Fiji.

Eulamia munsing (Bleeker) (fig. 6).

Carcharias (*Prionodon*) *munsing* Bleeker: Batavia-asch Genoot. Verh. (Madura), vol. 22, p. 16, 1849 (type loc., Madura Straits near Kammel and Surabaya).

Eulamia munsing Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8. no. 7, p. 375, 1923 (Honolulu).

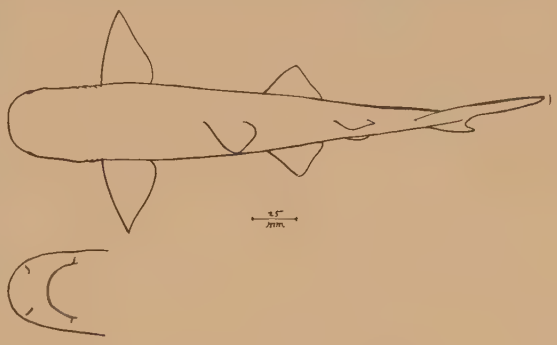

FIGURE 6.—Sketch of *Eulamia munsing.*

Head broadly depressed, about 1/5 of length to caudal base, greatly broader than high. Snout depressed, widely convex or blunt as seen from above. Eye small, lateral, about first third in head length; diameter about 1/3 in preoral length as seen in profile. Mouth large, well arched; length of arch 1 4/5 its width; slight groove above at angle. Teeth in about 24 rows; broadly triangular above, well serrated; lower teeth with entire slender cusps. Orbit 2 3/4 to nostril, which about same length. No spiracle. Scales rather diamond-shaped, with 5 strong parallel ridges formed to slightly serrated edges. First dorsal nearer ventrals than pectorals or origin about last 2/5 in space between pectoral and ventral origin. Second dorsal little smaller than first, slightly larger than anal. Origins of second dorsal and anal apparently opposite. Caudal about 1/5 total length. Width of pectoral 2/3 its length.

Uniform gray-brown above, under surface paler. Iris slaty.

Cast of specimen 1500 mm. long in the Bishop Museum, taken in the Honolulu market about 1904. The head, still in good condition, examined by me.

Interest attaches to this species as it has not previously been found in Oceania. There appears little doubt that the Hawaiian specimen is the same as the East Indian shark. It agrees with Garman's description, except that he says "head pointed," which may refer to the profile. Bleeker's description agrees in almost all respects. He gives the eye as midway between the snout tip and the gill opening. His type was 401 mm.

Hypoprion hemiodon (Müller and Henle).

Carcharias (*Hypoprion*) *hemiodon* (Valenciennes) Müller and Henle: Beschr. Plagiostomen, p. 35, pl. 19, fig. 12, teeth, 1841 (type loc., Pondicherry).

Carcharias hemiodon Weber: Siboga Exped., vol. 65, p. 590, 1913 (northwest Waigiu).

In *Glyphis, Eulamia, H. hemiodon,* and *H. macloti* all have no spiracle. In *Hypoprion* the teeth have serrations on the base in the upper series only.

India and East Indies.

Hypoprion macloti (Müller and Henle).

Carcharias (*Hypoprion*) *macloti* Müller and Henle: Beschr. Plagiostomen, p. 34, pl. 10, 1841 (type loc., New Guinea).—Dumeril: Hist. nat. Elasmobr., vol. 1, p. 350, 1865 (type).

Hypoprion macloti Garman: Mus. Comp. Zool., Mem., vol. 36, p. 121, 1913 (New Guinea).

Distinguished from *Hypoprion hemiodon* by the longer pointed snout and the more posteriorly inserted second dorsal fin.

Indian Ocean, East Indies.

Aprionodon acutidens (Rüppell).

Carcharias acutidens Rüppell: Neue Wirbelth., Fisch., p. 65, pl. 18, fig. 3, 1835 (type loc., Djedda, Red Sea).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 478, 1910 (Ponape).

Aprionodon acutidens Garman: Mus. Comp. Zool., Mem., vol. 36, p. 118, 1913 (Apiang, Kingsmills).

Teeth entire, with broad bases and cusps nearly or quite erect. One in the Agassiz Museum from Apiang.

Red Sea to the East Indies, Caroline and Kingsmill islands.

Scoliodon palasorrah (Cuvier).

Squalus palasorrah Cuvier: Regne animal, 2nd ed., vol. 2, p. 388, 1829 (on *Palasorra* Russell: Fishes of Coromandel, vol. 1, p. 19, pl. 14, 1803, type loc., Vizagapatam; Madras).

Carcharias (*Scoliodon*) *acutus* Schmeltz: Mus. Godeffroy, Cat. 5, p. 40, 1874 (South Seas).

Differs from *Aprionodon acutidens* (Rüppell) in the cusps in both jaws oblique, though agrees in the entire edges.

India and East Indies.

GALEORHINIDAE

Triaenodon obesus (Rüppell) (fig. 7).

Carcharias obesus Rüppell: Neue Wirbelth., Fisch., p. 64, pl. 18, fig. 2, 1835 (type loc., Djedda, Red Sea).

Triaenodon obesus Günther: Cat. fishes Brit. Mus., vol. 8, p. 383, 1870 (Aneiteum; New Hebrides).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 482, 1910 (Aneiteum; Tahiti).—Weber: Siboga Exped., vol. 65, p. 592, 1913 (northwest coast of Waigiu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 4, 1925 (Laysan, Lisiansky, and Wake islands).

Head depressed, broader than deep, slightly narrowed forward, width 1 1/3 in its length. Snout broad, very obtuse or widely rounded in front, length 2 1/4 in head. Eye small, lateral, with well developed nictitating membrane; hind eye edge little nearer end of snout than first gill opening. Mouth very broad, length of gape 1 2/3 in its width; labial folds rudimentary, very short. Teeth small, numerous, rows about 45; each tooth as median stronger cusp and 1 or 2 small ones each side basally. In profile nostrils slightly nearer end of snout than eye. Interorbital broad, depressed, nearly level. Gill opening about 1/3 of interorbital. No spiracle. Scales all small, tricarinate. First dorsal twice size of second, length 1 2/5 in head. Second dorsal slightly larger than anal, or little over half of head. Anal opposite second dorsal, fin 1 7/8 in head. Caudal about 3 1/2 in rest of body length, strong basal pit above and slight one below; subcaudal half length of upper lobe. Pectoral 1 1/6 in head, hind edge slightly concave, width 1 1/2 its length. Ventral inserted behind dorsal base, fin length 1 3/4 in head; claspers longer than fin.

Ash-brown, little paler on under surface of head and abdomen. Tips of dorsals and upper caudal lobe white. Lenth 1488 mm.

Known by its obtuse head, dull colors and white-tipped vertical fins. (Described from a specimen obtained at Laysan in 1923.)

Red Sea to the East Indies and Tahiti.

SPHYRNIDAE

Sphyrna zygaena (Linnè).

Squalus zygaena Linné: Systema nat., 10th ed., p. 234, 1758 (type loc., Europe; America).

Sphyrna zygaena Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 420, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 515, 1902 (1904) (Molokai).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 41, 1903 (1905) (Honolulu).—Jordan and Seale: (U.S.) Bur. Fish., Bull., vol. 25, p. 183, 1905 (1906) (Apia, Samoa).

Zygaena zygaena Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 484, 1910 (Samoa; Friendly and Hawaiian islands).

Zygaena malleus Günther: Cat. fishes, Brit. Mus., vol.

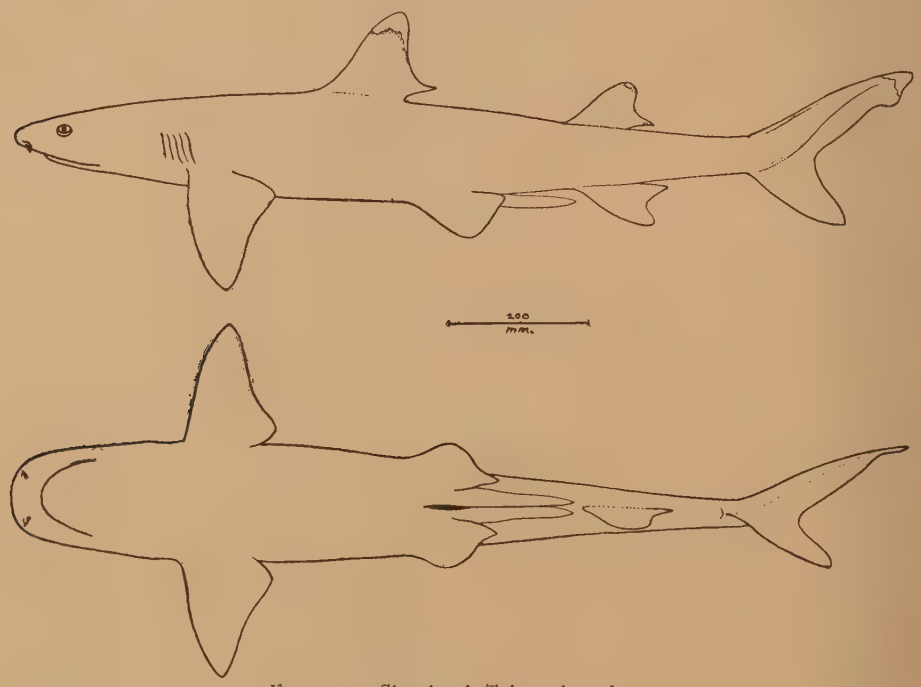

FIGURE 7.—Sketch of *Triaenodon obesus*.

8, p. 381, 1870 (Totoya, Fiji).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 41, 1874 (Tonga).—Günther: Rept. voyage "Challenger," vol. 1, pp. 58, 59, 1880 (Tongatabu, Honolulu).

In the Bishop Museum a cast of 1 specimen 872 mm. long, obtained in the Honolulu market. Also the head of a large specimen, 2128 mm. long, and the head across the hammer 632 mm. One seen since, during 1918, was 2432 mm. long. On December 2, 1922, I saw 7 small gray ones, and on December 23, found one. In the National Museum 2 half-grown Hawaiian specimens and in the Agassiz Museum 3. Dr. Ball reports the species frequent at the Fanning Islands in 1922.

I have not located any record for New Guinea, as given by Jordan and Seale.

Tropical and temperate seas.

Sphyrna oceanica (Garman).

Cestracion oceanica Garman: Mus. Comp. Zool., Mem., vol. 36, p. 158, 1913 (type loc., Society Islands).

Described by Garman evidently from small specimens as he says "in young of *C. zygaena,* three-fourths as long as the types of *C. oceanica,* the teeth are larger and more erect." The species is allied with *S. zygaena* and is said to further differ in the concavity above the nostril moderate, which is deep in *S. zygaena.*

Sphyrna tudes (Valenciennes).

Zygaena tudes Valenciennes: Mus. Hist. Nat. Paris, Mem., vol. 9, p. 225, pl. 12, figs. 1, a-b, 1822 (type loc., Mediterranean; Cayenne; Coromandel).—Lay and Bennett: Voyage "Beechey," Zool., p. 47, 1839 (Oahu).—Jouan: Soc. Cherbourg, Mem., vol. 8, p. 245, 1867 (Kanala, New Caledonia).

Distinguished from *S. zygaena* and *S. tudes* by the more exactly transverse and smaller hammer.

Circumtropical.

SQUALIDAE

Squalus suckleyi (Girard).

Spinax (Acanthias) suckleyi Girard: Acad. Nat. Sci. Philadelphia, Proc., p. 196, 1854 (type loc., Fort Steilacoom, Puget Sound).

Squalus mitsukuri Snyder: U. S. Fish Comm., Bull., vol. 22, p. 515, 1902 (1904) (Honolulu; off Maui).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 45, fig. 6, 1903 (1905) (Kailua).—Gilbert: op. cit., vol. 23, pt. 2, p. 580, 1903 (1905) (off Maui in 267 to 283 fathoms).

Acanthias mitsukurii Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 490, 1910 (Hawaii).

Cast in the Bishop Museum from a specimen 925 mm. long in 1913. One caught by J. W. Thompson about 1906 in Pearl Harbor. Others were seen, little smaller. In life, eye bottle-green and general body-color uniform brownish. Scales tridentate, strong median keels formed as midrib and each lateral marginal denticle greatly smaller. In the National Museum 4 specimens from Honolulu and one from off Maui.

Widely distributed in the Pacific.

Etmopterus villosus Gilbert.

Etmopterus villosus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 580, pl. 66, 1903 (1905) (type loc., off south coast of Molokai in 222 to 498 fathoms).

Known from the type, 170 mm. long, in the National Museum. It is similar, though much rougher than *Centroscyllium nigrum* Garman.

Centroscyllium nigrum Garman.

Centroscyllium nigrum Garman: Mus. Comp. Zool., Mem., vol. 24, p. 28, pl. 1, fig. 2, pls. 4 and 5 (anatomy), pl. 69, fig. 1, 1899 (type loc., N. Lat. 7° to 6°, W. Long. 81° in 546 to 555 fathoms).

Centroscyllium ruscosum Gilbert, U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 580, fig. 230, 1905 (1906) (type loc., near Kauai in 418 to 429 fathoms).

The type of *Centroscyllium ruscosum* Gilbert is in the National Museum.

ECHINORHINIDAE

Isistius brasiliensis (Quoy and Gaimard).

Scymnus brasiliensis (Cuvier) Quoy and Gaimard: Voyage "Uranie," Zool., p. 198, 1824 (type loc., Brazil).

Isistius brasiliensis Günther: Cat. fishes Brit. Mus., vol. 8, p. 420, 1870 (South Pacific).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 5, 1926 [note].

Leius brasiliensis Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 190, 1910 (Indo-Pacific).

Squalus fulgens F. D. Bennett: Narrative whaling voyage, vol. 2, p. 255, 1840 (type loc., S. Lat. 2½°, W. Long. 163°; N. Lat. 55°, W. Long. 110° [luminous]).

Apristurus spongiceps (non Gilbert) Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 3, 1922 (Hawaii).

Echinorhinus brucus (non Bonnaterre) Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 375, 1923 (Honolulu).

Body longer than tail, slender, tapering behind. Snout short, obtuse, tapers little from eye, depressed above, length 3/5 its width. Eye large, long as snout in profile; pupil rounded. Mouth wide, transverse, width greater than snout length and deep labial folds around angles. Teeth in about 20 rows in jaws; upper narrow, more slender; lower broadly triangular, edges entire, erect, not notched. Nostrils nearly at first third in snout length. Interorbital and head above depressed, surface convex. Gill opening small, before and all little above pectoral origin, last about half width of first. Spiracles large, deep, transverse, length 2/3 of eye and about 4/5 an eye diameter behind eye. Skin with small, simple scales, close-set in pavement. Dorsals and ventrals behind middle in total length. Dorsals small, rounded; first above and little before ventral origin; second well behind ventral, not reaching caudal. Caudal about 5½ in rest of body, with slight notch in upper lobe behind; subcaudal forms distinct lobe. Pectoral short, partly truncate, angles rounded. Ventral larger than dorsals.

Color dull vinaceous-brown above, paler below. Dark color of back extends as band completely encircling gill openings and same region of pharynx. Fins colored dark like back, except pectoral which pale greenish on under surfaces and hind portions above, also borders of most of other fins. Iris dusky, large pupil green.

Described from two specimens found in the Honolulu market, 317 and 395 mm. I have not found Jordan and Seale's reference for off Fiji. Bennett's first specimen would come from west of Christmas Island or southwest from Jarvis Island. The locality for his second specimen is certainly erroneous as the details given would pertain to inland Canada.

Tropical and temperate seas.

Euprotomicrus bispinatus (Quoy and Gaimard).

Scymnus bispinatus Quoy and Gaimard: Voyage "Uranie," Zool., p. 197, pl. 44, figs. 1-2, 1824 (type loc., Mauritius).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 28, 1869 (South Seas).

Euprotomicrus hyalinus R. S. Eigenmann: California Acad. Sci., Proc., 2nd ser., vol. 3, p. 35, 1890 (type loc., Pacific Ocean between San Francisco and Honolulu, but nearer the latter).

First dorsal distant from the pectorals, little behind midlength.

Mauritius to New Zealand and Hawaii.

RHINOBATIDAE

Rhynchobatus djeddensis (Forskål).

Raja djeddensis Forskål: Descriptiones animalium, p. 18, 1775 (type loc., Djedda, Red Sea).

Rhynchobatus djeddensis Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 491, 1910 (on Thiollière).

Rhinobatus jaram Thiollière: Fauna Woodlark, p. 230, 1857 (type loc., Woodlark Island).

Rostrum long, with pointed snout and ventrals opposite dorsal, distant from pectorals.

Red Sea to the East Indies.

Rhinobatos granulatus Cuvier

Rhinobatus granulatus Cuvier: Regne animal, vol. 2, 2nd ed., p. 396, 1829 (no type locality)—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 598, 1882 (New Guinea).

Rhinobatus (*Rhinobatus*) *granulatus* Müller and Henle: Beschr. Plagiostomen, p. 117, pl. 38, 1841 (Tranquebar and Pondicherry, types).

Three specimens in the National Museum from Port Moresby, New Guinea 270 to 372 mm. They all suggest Day's figure of *Rhinobatus thouini*. Internasal space 1½ in nostrils and teeth 56 above, 55 below in largest specimen. Rostral cartilages dorsally with 1 to 3 series of small spines.

India and East Indies.

Rhinobatos thouinianus (Shaw).

Raja thouiniana Shaw: General Zool., vol. 5, p. 318, pl. 147, fig. 2, 1804 (type loc., Museum of the Prince of Orange). (On *La raie thouin* Lacépède, Hist. nat. Poiss., vol. 1, p. 134, pl. 1, figs. 3-5, 1798.)

Rhinobatus thouini Macleay: Linn. Soc. New South Wales, Proc., vol. 8, pt. 2, p. 280, 1883 (Hood Bay, New Guinea).

Snout long and pointed, rostral edges smooth and the armature less developed than in *R. granulatus*.

East Indies.

Rhinobatos halavi (Forskål).

Raja halavi Forskål: Descriptiones animalium, pp. 8, 19, 1775 (type loc., Djedda, Red Sea).

Rhinobatus (*Rhinobatus*) *armatus* Bleeker: Soc. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).

Rhinobatus armatus Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 98, 1860 (New Guinea).—Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 298, 1868 (Waigiu).—Peters: Akad. Wiss. Berlin, Monatsb., p. 853, 1876 (1877) (Bougainville Island).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 492, 1910 (compiled).

In this species the snout is rather short and the disk more rounded than in the other species of this genus. The spines are also smaller.

Eastern Atlantic, Mediterranean, Red Sea to China and the East Indies.

DASYATIDAE

Dasyatis uarnak (Forskål).

Raia uarnak Forskål: Descriptiones animalium, pp. 8, 9, 18, 1775 (type loc., Red Sea).

Trygon uarnak Peters: Akad. Wiss. Berlin, Monatsb., p. 853, 1876 (1877) (Cartaret Harbor, New Ireland).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 492, 1910 (compiled).

? *Trygon pastinaca* (non Linné) Günther: Rept. voyage "Challenger," vol. 1, p. 37, 1880 (Arafura Sea).

No cutaneous folds or keels on tail, which 3 times length of body or more. Disk brown with dark spots and tail banded.

Red Sea to the East Indies.

Dasyatis gerrardi (Gray).

Trygon gerrardi Gray: List fish Brit. Mus., Chondr., pt. 1, p. 116, 1851 (type loc., India).

Leiobatus gerrardi Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).

Dasybatis gerrardi Garman: Mus. Comp. Zool., Mem., vol. 36, p. 377, 1913 (Samoa).

Trygon granulata Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 598, 1882 (type loc., New Guinea).

Himantura fai Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 184, fig. 2, 1905 (1906) (type loc., Apia, Samoa).

Trygon uarnak (part) Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 492, 1910 (on Jordan and Seale).

Differs from *D. uarnak* (Forskål) largely in the color, which brown with lighter spots.

Zanzibar to the East Indies and Samoa.

Dasyatis ponapensis (Günther).

Trygon ponapensis Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 493, 1910 (type loc., Kubary in Ponapé, Carolines).

From both *D. uarnak* (Forskål) and *D. gerrardi* (Gray) this differs in the tail but 1 1/2 times in the body and the color uniform. In *D. imbricatus* (Schneider) there are 2 tentacles at the bottom of the mouth. *D. ponapensis* has 4.

Dasyatis latus (Garman).

Trygon lata Garman: Mus. Comp. Zool., Bull., vol. 6, p. 170, 1880 (type loc., Hawaiian islands).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 493, 1910 (copied).

Dasibatis lata (Garman) Jordan and Gilbert: U. S. Nat. Mus., Bull., vol. 16, p. 67, 1883 (type).

Dasyatis lata Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 47, 1903 (1905) (copied).

Dasybatus latus Garman: Mus. Comp. Zool., Mem., vol. 36, p. 383, pl. 32, figs. 1-2, 1913 (type).

Dasyatis sciera Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 421, pl. 1, fig. 2, 1902 (1903) (type loc., Honolulu).—Snyder: op. cit., vol. 22, p. 515, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 47, pl. 4, fig. 2, 1903 (1905) (type).

Disk smooth. Tail finely spinescent, without keel or fold above, well developed fold present below. Above light olive-brown, below white and tail brownish.

One specimen in the Bishop Museum from Honolulu with disk 330 mm. and tail 743 mm. A dried tail 988 mm. long, possibly belonging to this species, was cut at the insertion of the caudal spine. It is very thorny, with two rows of spines more or less laterally, a supralateral row each side, a fine row of superior thorns and scattered fine thorns along base of lower cutaneous fold, which well developed. Obtained in

the Honolulu market and now in the Bishop Museum. It is of interest as indicating that the species attains a large size. A third Honolulu specimen in the Bishop Museum has a disk 304 mm. long and the tail 533 mm. In the Honolulu market I found one on December 17, 1922, another December 22, and 3 very large specimens December 23. In the National Museum I examined the type of *Dasyatis sciera* Jenkins.

Dasyatis sephen (Forskål).

Raja sephen Forskål: Descriptiones animalium, p. 17, 1775 (type loc., Djedda and Lohaja, Red Sea).

Trygon sephen Peters: Akad. Wiss. Berlin, Monatsb., p. 853, 1876 (1877) (New Britain).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 384, 1910 (New Pomerania; Pelew Islands).

Differs from *D. latus* (Garman) in the tail nearly thrice length of disk; tubercles depressed, pointed, form pavement on middle of back; brown; tail blackish.

Red Sea, East Indies, Micronesia.

Dasyatis kuhlii (Müller and Henle).

Trygon kuhlii Müller and Henle: Beschr. Plagiostomen, p. 164, pl. 51, fig. 1, 1841 (type loc., Vanicoro; New Guinea; India).—Bleeker: Soc. Ind. Neerl., Act., no. 2, vol. 6, p. 5, 1859 (Doreh, New Guinea).—Peters: Akad. Wiss. Berlin, Monatsb., p. 853, 1876 (1877) (New Ireland).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 494, 1910 (Tongatabu; Samoa).

Trygon kuhli Günther: Rept. voyage "Challenger," vol. 1, p. 58, 1880 (Tongatabu).

Raya trigonoides Castelnau: Zool. Acclim. Soc. Victoria, Proc., vol. 2, p. 121, 1873 (type loc., Noumea, New Caledonia).

In this species tail with cutaneous fold both above and below, about twice length of disk. Back smooth to rough, tubercles in a vertical row. Brown with black-edged blue spots.

One specimen examined in the National Museum from Ugi, Solomon Islands, an adult male.

India to the East Indies, Japan and Samoa.

Dasyatis brevis (Garman).

Trygon brevis Garman: Mus. Comp. Zool., Bull., vol. 6, p. 171, 1880 (type loc., Payta, South America).

Dasyatis hawaiensis Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 420, pl. 1, fig. 1, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 48, pl. 4, fig. 1, 1903 (1905) (type).

Trygon hawaiensis Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 494, 1910 (copied).

Differs from *D. kuhlii* (Müller and Henle) in the tail 1 1/2 disk lengths, back smooth to rough and brown, olive to grayish.

In December, 1922, I examined several specimens in the Honolulu market. One 1216 mm. across was seen December 15, another about the same size the next day, and one 354 mm. across on December 27. The type of *D. hawaiensis* Jenkins was also examined in the National Museum.

Peru and California to Hawaii.

Taeniura lymma (Forskål).

Raja lymma Forskål: Descriptiones animalium, p. 17, 1775 (type loc., Djedda and Lohaja, Red Sea).

Taeniura lymma Günther: Cruise of "Curacoa," p. 409, 1873 (Solomons).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 495, 1910 (New Mecklenburg; Solomons).—Garman: Mus. Comp. Zool., Mem., vol. 36, p. 399; pl. 53, fig. 4; pl. 55, fig. 7; pl. 71, figs. 4-5, 1913 (Fiji).

Taeniura lymma Schmeltz: Mus. Godeffroy, Cat. 5, p. 41, 1874 (Kandavu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 598, 1882 (New Guinea).

Trygon halgani Lesson: Voyage "Coquille," Poiss., vol. 1, pt. 2, p. 100, pl. 3, 1830 (type loc., Offack Bay, Waigiu; Port Praslin, New Ireland).

Trygon halganii Schmeltz: Mus. Godeffroy, Cat. 4, p. 29, 1869 (Kandavu).

Discobatis marginipinnis Maclay and Macleay: Linn. Soc. New South Wales, Proc., vol. 10, p. 676, pl. 46, figs. 7-15, 1886 (type loc., Pacific Ocean near Admiralty Islands).

Discotrygon marginipinnis Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 462, 1910 (on Maclay and Macleay).

One from Port Moresby, New Guinea, a male in the National Museum, examined.

Taeniura atra Macleay.

Taeniura atra Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 598, 1882 (type loc., New Guinea).

Differs from *T. lymma* (Forskål) in rough skin, disk broader than long and short vertebral row of rounded tubercles. Disk brown to black, without blue spots.

Urolophus armatus Müller and Henle.

Urolophus armatus (Valenciennes) Müller and Henle: Beschr. Plagiostomen, p. 174, 1841 (type loc., New Ireland).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 495, 1910 (compiled).

Short stout tail with serrated spine. Disk wider than long, back spinose and tubercle on shoulder girdle. Spotted with black.

Trygonoptera testacea Müller and Henle.

Trygonoptera testacea (Banks) Müller and Henle: Beschr. Plagiostomen, p. 174, pl. 56, 1841 (type loc., Australia).

Trygonoptera australis Steindachner: Akad. Wiss. Wien., Sitz., vol. 53, pt. 1, p. 480, pl. 7, 1866 (type loc., South Sea).

Differs from *Urolophus armatus* Müller and Henle in the presence of a dorsal fin and short tail with rayed caudal fins. Back uniform reddish brown.

Pteroplatea poecilura (Shaw).

Raia poecilura Shaw: Gen. zool., vol. 5, p. 291, 1804 (on *Tenkee kunsul* Russell, Fishes of Coromandel, vol. 1, p. 4, pl. 6, 1803, type loc., Vizagapatam).

Raja pastinaca var. *altavela* (non Linné) Lichtenstein: Descriptiones animalium, p. 256, 1844 (Tanna).

No dorsal, disk very wide and short slender tail pointed, nearly long as body, without folds or keels.

Red Sea, East Indies, Tanna.

MYLIOBATIDAE

Pteromylaeus punctatus (Maclay and Macleay).

Myliobates punctatus Maclay and Macleay: Linn. Soc. New South Wales, Proc., vol. 10, p. 675, pl. 46, figs. 1-6, 1886 (type loc., Admiralty and Lub or Hermit Islands).

Aetobatis punctata Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 497, 1910 (copied).

Teeth in more than 3 rows in each jaw. Side of head free from pectorals. Caudal spine present. Origin of dorsal near ends of pectoral bases. Back greenish-gray with irregular white spots.

Aetobatus narinari (Euphrasen).

Raia narinari Euphrasen: Kon. Svensk. Akad., Handlingar, vol. 11, p. 217, pl. 10, 1790 (type loc., St. Bartholomew Island, West Indies).

Raja narinari Schneider: Systema ichth. Bloch, p. 361, 1801 (Tahiti).

Aetobatis narinari Schmeltz: Mus. Godeffroy, Cat. 5, p. 41, 1874 (South Sea).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 496, 1910 (Hawaiian islands; Samoa; Solomons).

Aetobatis narrinari Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 519, 1901 (Laysan).

Aetobatus narinari Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 20, 22, 1902 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 421, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 515, 1902 (1904) (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 5, 1925 (Johnston Island).—Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., 4th ser., vol. 16, p. 651, November 14, 1927 (Honolulu).

Stoasodon narinari Jordan and Evermann: U. S. Fish Comm., Bull. 23, pt. 1, p. 49, fig. 7, 1903 (1905) (Honolulu; Hilo).

Raia quinqueaculeata Quoy and Gaimard: Voyage "Uranie," Zool., p. 200, pl. 43, fig. 3, 1824 (type loc., Guam).

Raja edentula (Forster) Lichtenstein: Descriptiones animalium, pp. 227, 256, 1844 (type loc., Tahiti; Tanna).

Goniobatis meleagris Agassiz: Boston Soc. Nat. Hist., Proc., vol. 6, p. 385, 1859 (type loc., Hawaiian islands)

Three specimens from Honolulu in the Bishop Museum. The disk of the largest is 428 mm. and the tail 2067 mm. When freshly caught color of disk above pale greenish-gray, spotted with whitish, though spots appear most distinct and crowded on disk posteriorly. The smaller specimens have smaller and rather fewer white spots. One from Johnston Island 240 mm. to caudal base. One in the Agassiz Museum from Honolulu. One in the National Museum, also from Honolulu.

MOBULIDAE

Manta birostris (Walbaum).

Raja birostris Walbaum: Artedi, Piscium, pt. 3, p. 535, 1792 (on *Diabolus marinus* Willughby: Historia Piscium, Append., p. 5, pl. 9, fig. 3, 1686, no type locality; *Divel*: Pennant, Arctic zool., vol. 2, pt. 4, p. 354, 1792, [copied]; Catesby, Nat. hist. Carolinas, Append., p. 32, 1771, type loc., Carolina).

Manta birostris Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 375, 1923 (Honolulu).—Fowler: op. cit., Bull. 38, p. 4, pl. 1, figs. d-g, 1927 (Fanning Island).

Mobula japonica (non Müller and Henle) Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 50, 1903 (1905) (Honolulu).

Cast in the Bishop Museum of a large specimen, width about 2128 mm., obtained in the Honolulu market, reported captured off the shore of Oahu, about June, 1909. Most of the head and thorax are still preserved. Its wide anterior terminal mouth render the identification of the specimen certain. So far as I can find it does not appear to have had a caudal spine, and there is no trace of it on the cast. The band of minute teeth extends over about 4/5 the width of the lower jaw and is estimated to comprise (from half of each jaw) about 150 rows, or 75 counted in the right half of the jaw. Right cephalic fin 228 mm. along inner edge. Eye 35 mm. Uppermost gill opening 216 mm. Spiracle wide as eye. Under a lens asperities seen as bony keels, bases each with 8 to 11 basal radiations. Skin finely asperous, both on upper surface of disk and on lower thoracic surface. In alcohol upper surface dusky-brown and lower surface whitish.

The occurrence of this creature in Oceania is of interest and evidently suggests that the left cephalic fin of the specimen recorded as *Mobula japonica* by Jordan and Evermann may be *Manta birostris* (Walbaum).

Immense rays have been reported by both white and Hawaiian observers on the Napoli coast of Kauai.

Mobula japonica (Müller and Henle).

Cephaloptera japonica Müller and Henle: Systemat. Beschr. Plagiostomen, p. 185, 1841 (type loc., Japan).

Mobula japonica Fowler: B. P. Bishop Mus., Bull. 38, p. 3, pl. 1, figs. a-c, 1927 (Honolulu).

Closely related to the Indian *Mobula eregoodoo-tenkee* (Cuvier) which is said to differ in the absence of the serrated caudal spine. In both the dental bands nearly or quite reach mouth angles.

CHIMAERIDAE

Chimaera gilberti Garman.

Chimaera gilberti Garman: Mus. Comp. Zool., Mem., vol. 40, no. 3, p. 90, 1911 (type loc., Kauai; Hawaii, in 957 to 1067 fathoms).

Chimaera purpurascens (non Gilbert in Jordan and Snyder) Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 582, fig. 231, 1903 (1905) (Kauai).

A dark species, uniform or purplish plum color. Length 900 mm.

ELOPIDAE

Elops hawaiensis Regan.

Elops hawaiensis Regan: Ann. Mag. Nat. Hist., 8th ser., vol. 3, p. 39, 1909 (type loc., Hawaiian Islands).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 386, 1910 (Hawaii).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 204, 1911 (Honolulu).

Elops hawaiiensis Fowler: Copeia, no. 112, p. 82, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 23, 1925 (Honolulu).

Elops saurus (non Linné) Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 594, 1882 (New Guinea).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 496, 1900 (Hawaiian Islands).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 513, 1901 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 432, 1902 (1903) (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 53, 1903 (1905) (Honolulu).

Head 3 1/2 to 3 4/5; depth 4 4/5 to 6; D. v to VIII, 17, I or 18, I; A. IV or V, 11, I or 12, I; scales 85 to 95 in lateral line to caudal base and 7 more on latter; 12 to 14 scales above lateral line, 10 below; predorsal scales 38 to 42; snout 3 5/6 to 4 1/4 in head; eye 4 1/8 to 5 1/3; maxillary 1 3/4 to 1 7/8; interorbital 4 2/3 to 5 1/2; gill rakers 7 or 8+16 or 17, lanceolate, about 1 1/2 in eye. Scales with 13 or 14 basal striae, circuli very fine.

One in the Bishop Museum 208 mm. long and a head 152 mm., both from Honolulu. I examined over 700 specimens in the Honolulu market, the largest about 912 mm. long. One in the National Museum obtained by Wilkes at Hilo is 735 mm. long. One in the Academy

from Honolulu, 266 mm., obtained by Jones. The Agassiz Museum has 5 specimens without locality, likely Hawaiian?

Some of Regan's distinctions are unreliable, such as 13 to 14 lower gill rakers, all the specimens I examined with 16 or more. He gives the scales as 96 to 98. These details bring it within the range of the species he calls *Elops saurus* and *Elops affinis*. Though Jordan and Seale give Samoa as a locality no previously published record appears to have been given.

Megalops cyprinoides (Broussonet).

Clupea cyprinoides Broussonet: Tableau ichth., no pagination, pl., 1782 (type loc., "Oceans between the tropics" [not Jamaica, Antigua, Rio Janeiro], Tanna Island, Pacific).—Lichtenstein: Descriptiones animalium, Forster, p. 296, 1844 (Tanna Island).

Megalops cyprinoides Günther: Cat. fishes Brit. Mus., vol. 7, p. 471, 1868 (Aneiteum, New Hebrides).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 37, 1874 (Kandavu; Upolu).—Günther: Rept. voyage "Challenger," vol. 1, p. 36, 1880 (Ovalau, Fiji).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 278, 1883 (Goldie River in fresh-water, New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 63, 1900 (1901) (Guam).—Seale: op. cit., vol. 4, no. 1, p. 4, 1906 (Tubuai, Austral Islands).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 185, 1905 (1906) (Apia).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 387, 1909 (Society Islands).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 204, 1911 (Apia).—Weber: Nova Guinea, vol. 9, pt. 4, p. 515, 1913 (Lorentz River, Alkmaar, Merauke).—Weber and Beaufort: Fishes Indo-Australian Arch., vol. 2, p. 5, fig. 4, 1913 (Merauke, Goldie River).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 4, 31, 1925 (Guam, Samoa).

Clupea thrissoides Schneider: Systema ichth., Bloch, p. 424, 1801 (type loc., Atlantic and Pacific oceans) (on Broussonet).

Clupea setipinna (Forster) Valenciennes: Hist. nat. Poiss., vol. 19, p. 285, 1846 (type loc., Tahiti). (Name in text.)

Megalops macropterus Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 594, 1882 (New Guinea).

Head 3 1/4 to 3 1/2; depth 3 1/8 to 3 1/3; D. v, 15, 1; A. iv, 19, 1 to 22, 1; scales 35 or 36 in lateral line to caudal base and 3 or more on latter; 6 scales above lateral line, 6 below; 17 or 18 predorsal scales; snout 4 to 4 2/5 in head measured from upper jaw tip; eye 3 to 3 1/3; maxillary 1 2/3 to 1 4/5; interorbital 4 1/4 to 5. Gill rakers 17+13, lanceolate, 1/4 longer than gill filaments, which half of eye. Scales with 10 basal radiating striae.

Two specimens in the Bishop Museum, one 209 mm. from Guam and the other 309 mm. from Tubuai. Two also obtained at Guam in 1923. In the Academy 3 from Apia, Samoa.

ALBULIDAE

Albula vulpes (Linné).

Esox vulpes Linné: Systema nat., 10th ed., p. 313, 1758 (type loc., Bahama Islands). (On "Bone Fish" Catesby, Nat. hist. Carolinas, pl. 2, fig. 1, 1737).

Albula vulpes Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 2, p. 15, 1902 (Hilo), p. 18 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 432, 1902 (1903) (Honolulu).—Snyder: U. S. Fish Comm., Bull., vol. 22, p. 521, 1902 (1904) (Hanalei Bay, Kauai).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 55, 1903 (1905) (Honolulu; Hilo).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 5, 1906 (Tahiti).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 242, 1911 (Funafuti; Ellice Islands).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 2, p. 7, fig. 5, 1913 (New Guinea).—McCulloch: Australian Mus. Rec., p. 172, 1919 (Malekula, New Hebrides; Hood Bay, New Guinea).—Fowler: B. P. Bishop Mus., Bull. 22, p. 4 (Guam), p. 23, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus. Bull. 26, p. 5, 1925 (Lisiansky).—Fowler: op. cit., Bull. 38, p. 5, 1927 (Christmas Island).

Esox argenteus Schneider: Systema ichth. Bloch, p. 395, 1801 (type loc., Australia; New Zealand).—Lichtenstein: Descriptiones animalium, Forster, pp. 196, 256, 1844 (Tahiti; Tanna).

Synodus argenteus Schneider: Systema ichth., Bloch, p. 398, 1801 (no type locality).

Butirinus gloosodonta Lay and Bennett: Voyage "Beechey," Zool., p. 46, 1839 (Oahu).

Conorhynchus glossodon Bleeker: Atlas ichth., vol. 6, p. 83, pl. 12, 270, fig. 1, 1866-77 (New Guinea).—Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, pt. 2, p. 300, 1868 (Waigiu).

Albula glossodonta Steindachner: Akad. Wiss. Wien., Denk., vol. 70, p. 513, 1901 (Honolulu).

Albula glossodon Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 385, 1909 (Society and Hawaiian islands).

Albula neoguinaica Valenciennes: Hist. nat., Poiss., vol. 19, p. 253, 1846 (type loc., New Guinea).

Albula seminuda Valenciennes: Hist. nat., Poiss., vol. 19, p. 254, 1846 (type loc., New Guinea).

Albula erythrocheilos Valenciennes: Hist. nat., Poiss., vol. 19, p. 254, pl. 540, 1846 (type loc., Friendly Islands; Tongatabu; Borabora).

Albula forsteri Valenciennes: Hist. nat., Poiss., vol. 19, p. 256, 1846 (type loc., Tahiti).—Thiollière: Fauna Woodlark, p. 207, 1857 (Woodlark Island).

Albula conorhynchus Streets: U. S. Nat. Mus., Bull., vol. 7, p. 76, 1877 (Honolulu).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 18, 1877 (Samoa).—Günther: Rept. voyage "Challenger," vol. 1, p. 61, 1880 (Hilo).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 593, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 278, 1883 (Hood Bay, New Guinea).

Albula virgata Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 6, pl. 1, fig. 1, 1922 (type loc., Honolulu and Hilo).

Four in the Bishop Museum from Tahiti, and 1 from Honolulu 596 mm. long, also head of specimen from Lisiansky. More than 1000 specimens seen or examined in the Honolulu markets, the largest about 760 mm. Five from Guam in 1923. In the National Museum I examined 1 specimen from Honolulu obtained by Streets and 2 from Funafuti collected by the Albatross. The Agassiz Museum has 43 Hawaiian specimens, 24 from the Society Islands, and 1 from Funafuti.

In describing their nominal *Albula virgata*, Jordan and Jordan state, "the common Oió of the markets of Hawaii differs markedly in color from *Albula vulpes* of the American coasts, as well as from all the nominal species of the genus hitherto described. The Hawaiian fish is dusky, marked with distinct stripes much like the markings of a striped mullet (*Mugil*

cephalus)." I have certainly found brilliantly silvery specimens in the Honolulu markets, both with and without the dark longitudinal lateral lines along the back, as figured by Jordan and Jordan. I am more inclined to think these dark lines are far more distinct in formaline than in alcoholic specimens, as I find this is true in Atlantic material at hand. Weber and Beaufort give its dimensions as over 900 mm.

The species is circumtropical.

CHANIDAE

Chanos chanos (Forskål) (Pl. I, *B*).

Mugil chanos Forskål: Descriptiones animalium, pp 14, 74, 1775 (type loc., Djedda, Red Sea).

Chanos chanos Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 514, 1901 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 432, 1902 (1903) (Honolulu).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 28, p. 124, 1904 (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 56, fig. 10, 1903 (1905) (Moanalua, Honolulu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 186, 1905 (1906) (Samoa).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 387, 1909 (New Caledonia, Samoa, Hawaiian and Society islands).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 243, 1911 (Makemo and Niau, Paumotus).—Weber and Beaufort: Fishes Indo-Austral. Archipelago, vol. 2, p. 15, fig. 8, 1913 (New Guinea).—Fowler: B. P. Bishop Mus., Bull. 22, p. 23, 1925 (Honolulu).—Fowler: op. cit., Bull. 38, p. 5, 1927 (Fanning and Christmas islands).

Mugil salmoneus (Forster) Schneider: Systema ichth., Bloch, p. 421, 1801 (type loc., Pacific Ocean).—Lichtenstein: Descriptiones animalium, Forster, p. 299, 1844 (Tanna).

Chanos salmoneus Valenciennes: Hist. nat. Poiss., vol. 19, p. 146, 1846 (between New Caledonia and Norfolk Island).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 38, 1878 (New Guinea).—Günther: Rept. voyage "Challenger," vol. 1, p. 61, 1880 (Honolulu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 594, 1882 (New Guinea).—Vaillant: Soc. Philom. Paris, Bull., 7th ser., vol. 11, p. 53, 1886-87 (Tahiti).

Chanos cyprinella Eydoux and Souleyet: Voyage "Bonite," Zool., vol. 1, p. 196, 1841 (type loc., Hawaiian islands).—Valenciennes: op. cit., p. 144 (Honolulu).

Chanos oriental Eydoux and Souleyet: Voyage "Bonite," Zool., vol. 1, p. 196, pl. 7, fig. 1, 1841 (type loc., Hawaiian islands) (name in synonymy).

Chanos orientalis Schmeltz: Mus. Godeffroy, Cat. 4, p. 25, 1869 (Viti Islands).

Chanos chloropterus Kner: Reise "Novara," Fisch., vol. 1, pt. 5, p. 341, 1865 (Tahiti).

Head 3 1/2 to 4 1/2; depth 3 1/2 to 4 3/4; D. IV to VI, 9, I to 12, I; A. III 6, I to 8, I; scales 78 to 80 in lateral line to caudal base and 8 to 11 more on latter; 13 scales above lateral line, 9 to 11 below; 30 to 46 predorsal scales.

Body well compressed, deepest at dorsal origin. Caudal peduncle rather slender, about half deep as long. Head width 2 1/8 in its length. Snout conic, length 3/4 its width or 3 1/5 to 4 in head. Eye with hind edge about midway in head, slightly posterior in younger, covered with large adipose-eyelid; 3 3/4 to 7 in head. Mouth small. Maxillary not quite reaching eye, slips below long preorbital, toothless, 4 to 4 1/4 in head. Mandible slightly included within upper jaw. Interorbital 2 1/2 to 3 1/8 in head. Gill rakers 147 to 160 + 107 to 165, fine, extremely slender, 2 1/2 to 3 in gill filaments. Scales with 31 to 51 horizontal parallel striae ending in slender points, basal notch well developed and rather coarse circuli 12 to 15 or fine. Lateral line with simple tubes. Dorsal origin midway between front eye edge and caudal base, or midway between front pupil edge and caudal base in younger. Anal small, little nearer caudal base than ventral origin. Caudal deeply forked, about half an eye diameter longer than head. Pectoral reaches 3/5 to ventral. Ventral inserted behind dorsal origin, reaches about 3/5 to anal. Dull olive-brown, little paler below, silvery-white in life.

Two specimens in the Bishop Museum from Honolulu, 189 to 854 mm. In the Honolulu market, where quantities of young are brought in each day, I examined more than a thousand specimens. In the National Museum I examined a number of specimens from Oahu, Honolulu, Fiji, Niau Island, Makemo, and New Guinea. The Wilkes collection still contains a specimen from Oahu and one from Fiji. Variation in the scales in the lateral line shows them to exceed the alleged differences as suggested by E. K. Jordan (U. S. Nat. Mus., Proc., vol. 66, p. 3, 1925). In the Agassiz Museum 3 Hawaiian specimens and 2 from the Tuamotus.

CHIROCENTRIDAE

Chirocentrus dorab (Forskål).

Clupea dorab Forskål: Descriptiones animalium, p. 72, 1775 (type loc., Djedda and Mochha, Red Sea).—Valenciennes: Hist. nat. Poiss., vol. 19, p. 110, 1846 (New Guinea).—Jouan: Soc. Cherbourg, Mem., vol. 8, p. 306, 1861 (Kanala, New Caledonia).—Jouan: op. cit., vol. 21, p. 335, 1877-78 (on preceding).

Chirocentrus dorab Bleeker: Atlas ichth., vol. 6, p. 92, pl. (13) 271, fig. 3, 1866-72 (New Guinea).—Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).—Peters: Akad. Wiss. Berlin, Monatsb., p. 846, 1876 (1877) (New Britain).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 594, 1882 (New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 388, 1909 (compiled).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 2, p. 18, fig. 11, 1911 (New Guinea).

Two specimens in the National Museum from Fiji.

GONORHYNCHIDAE

Gonorhynchus gonorynchus (Linné).

Cyprinus gonorynchus Linné: Systema nat., 12th ed., p. 528, 1766 (type loc., Cape of Good Hope).

Gonorhynchus gonorynchus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 375, 1923 (Honolulu).

Gonorhynchus moseleyi Jordan and Snyder: Washington Acad. Sci., Jour., vol. 13, p. 347, September, 1923 (type loc., Honolulu).

Head 4 1/4; depth 8 1/2; D. II, 8, I; A, II, 6, I; scales 150 in lateral line to caudal base and 10 more on latter; 16 scales above lateral line, 16 below to anal origin; about 115 predorsal scales to snout tip; head width 2 1/8 in its length; snout 2 2/3; eye 4 1/2; preoral 4 1/8; interorbital 3 4/5; pectoral 1 1/3; caudal 1 3/5. Barbel half of eye. Scales with 12 basal radiating striae, edge evenly scalloped; 11 or 12 apical denticles, graduated down from median, which largest and strongest. Dorsal origin slightly behind ventral origin, fin but little larger. Anal inserted midway between ventral origin and caudal base, fin long as ventral. Caudal emarginate.

When fresh pale sandy-gray above. Under surface of head and body, edges of pectoral and ventral, all of anal and bases of dorsal and caudal, white. Median terminal portions of paired fins blackish. Ends of dorsal and caudal blackish. Iris pale yellow. Length 123 and 166 mm.

Two specimens in the Bishop Museum both from the Honolulu market, May 31, 1922, and October 3.

The occurrence of a member of this family in Oceania is of interest as greatly extending its range. The species was formerly known from South Africa, Australia, New Zealand, and Japan.

CLUPEIDAE

Etrumeus micropus (Schlegel).

Clupea micropus Schlegel: Fauna Japonica, Poiss., pts. 10-14, p. 236, pl. 107, fig. 2, 1846 (type loc., southeast coast of Japan).

Etrumeus micropus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 432, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 521, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 58, 1903 (1905) (Honolulu).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 385, 1909 (Hawaiian islands).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 205, 1911 (Honolulu).—Fowler: Copeia, no. 112, p. 82, Nov. 20, 1922 (Hawaii).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 5, 1925 (Lisiansky).

Head 3 1/3 to 4 1/4; depth 5 1/3 to 5 7/8; D. III, 16, 1; A. III, 8, 1, rarely III, 7, 1; scales 53 to 55 in median lateral series to caudal base and 4 more on latter; 13 or 14 scales transversely at dorsal origin; 21 or 22 predorsal scales.

Body elongate, partly cylindrical. Head width 1 3/4 to 2 1/8 in its length. Snout width 1 1/4 to 1 2/5 its length, which 3 to 3 1/4 in head measured from upper jaw tip. Eye very slightly advanced from center in head, 3 to 3 1/8 in head length. Maxillary not quite reaching eye, 2 2/3 to 3 in head. Interorbital 4 to 5 in head. Gill rakers 16 + 33, slender, lanceolate, slightly longer than gill filaments or about half of eye. Scales with many as 5 apical striae, also 3 or 4 above and same number below but not connected; circuli parallel, convex, fine, none basally. Dorsal origin about midway between snout tip and last anal ray base. Ventral inserted close after dorsal. Dusky lilac-brown on back, sides and below whitish with brassy tint. Iris whitish. Fins pale. Length 70 to 228 mm.

Günther gives the length to 330 mm.

Eleven specimens in the Bishop Museum from Honolulu and 1 from Hilo. Two specimens in the National Museum obtained by Wilkes at Oahu. The Agassiz Museum has 2 Hawaiian specimens obtained by Andrew Garrett. Six in the Academy from Honolulu.

Widely distributed in the Pacific from Japan and Hawaii to California.

Stolephorus delicatulus (Bennett).

Clupea delicatula Bennett: Comm. Zool. Soc. London, Proc., vol. 1, p. 168, 1831 (type loc., Mauritius).

Spratelloides delicatulus Schmeltz: Mus. Godeffroy, Cat. 5, p. 37, 1874 (Samoa).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 383, 1909 (Samoa, Jaluit, Bonham Islands).

Stolephorus delicatulus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 186, 1905 (1906) (Apia and Pago Pago).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 5, 1906 (Shortland Island, Solomons).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 243, 1911 (Taritari, Gilbert Islands; Arhno, Marshall Islands; Rangiroa, Paumotus).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 375, 1923 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 4, 1925 (Guam).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 5, 1925 (Lisiansky).

Albula vulpes (non Linné) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 5, 1906 (Faté, New Hebrides).

Head 2 3/4 to 4 1/4; depth 4 to 5 4/5; D. II, 9 or 10; A. II, 7 or 8; scales 32 to 36 in median lateral series to caudal base and 3 more on latter; 7 to 9 scales transversely at dorsal origin; 12 to 15 predorsal scales.

Body moderately compressed, fusiform. Head width 2 1/8 to 2 1/3 in its total length. Snout conic, width 1 to 1 1/4 in its length, which 3 1/5 to 3 3/5 in head measured from upper jaw tip. Eye advanced, hind pupil edge about midway in head length; 3 to 3 2/3 in head from snout tip. Mouth small, gape very short, lower jaw slightly protruding. Maxillary reaches to or slightly beyond front eye edge, to pupil in young; 2 1/2 to 2 4/5 in head from upper jaw tip. Mandibular rami well elevated inside mouth. Interorbital little convex, 3 4/5 to 5 1/4 in head from upper jaw tip. Cheek with large prominent striae, extending also on preopercle and opercle. Gill rakers 6 to 10 + 21 to 30, finely lanceolate, little longer than gill filaments or about 3/4 of eye. Inner edge of gill opening with deep notch behind isthmus. Scales thin, largely adherent, narrowly imbricate, with 2 to 7 vertical striae, often irregular. Dorsal origin about midway between snout tip and last anal ray base, about midway between snout tip and caudal base in young. Anal inserted about midway between caudal base and ventral origin. Caudal well forked, small, with basal alar scale to each lobe. Pectoral reaches 2/5 to ventral. Ventral inserted nearly below middle of dorsal.

Color of back slaty, line of demarcation above eye well contrasted from silvery-white of eye and lower surface. Fins pale. Length 32 to 62 mm.

Reaches 90 mm., according to Günther.

Eight specimens in the Bishop Museum from Honolulu, first obtained in 1919. Two from Shortland Island, Solomon Islands, and 2 from Faté, New Hebrides. The 2 from Faté are No. 887 and are doubtless the two young specimens of "Albula vulpes" listed by Seale as No. 833. Also 31 specimens collected by C. M. Cooke, Jr., and C. M. Cooke, III., Nov. 5, 1922, at Laie Beach, Oahu. Five from off Lisiansky and 17 from Guam in 1923. In the National Museum 4 from Tongatabu obtained by Wilkes. In the *Albatross* collections, 15 from the Gilbert Islands, 49 from Arhno Atoll and 2 from Rangiroa. In the Agassiz Museum 12 from west coast of Kauai, Hawaii, obtained by the ship *Sky Lark* in 1857.

Widely distributed from Mauritius, the East Indies and Australia, through Oceania to the Tuamotu Islands and Hawaii.

Stolephorus alburnus (Kner).

Alausa alburnus Kner: Akad. Wiss. Wien, Sitz., vol. 54, pt. 1, p. 387, pl. 1, fig. 16, 1866 (type loc., "Valparaiso, Chili").—Schmeltz: Mus. Godeffroy, Cat. 4, p. 25, 1869 (Samoa).

Spratelloides alburnus Schmeltz: Mus. Godeffroy, Cat. 5, p. 37, 1874 (Samoa).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 384, 1909 (Samoa).

Said to reach but 50 mm. Both this and *Stolephorus japonicus* (Houttuyn) differ from *Stolephorus delicatulus* in the increased anal rays (11 to 13). *Stolephorus alburnus* has, however, scales similar in size to those of *Stolephorus delicatulus*.

Known only from Samoa.

Stolephorus japonicus (Houttuyn).

Atherina japonica Houttuyn: Hollandsche Maatsch. Wet. Haarlem, Verh., vol. 20, pt. 2, p. 340, 1782 (type loc., Japan).

Spratelloides gracilis Schmeltz: Mus. Godeffroy, Cat. 5, p. 37, 1874 (Viti Levu).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 384, 1909 (Fiji).

Clupea argyrotaenia Regan: Zool. Soc. London, Trans., vol. 20, pt. 6, p. 276, 1914 (Mimika River, New Guinea).

Reaches 90 mm. Differs from both *S. alburnus* (Kner) and *S. delicatulus* (Bennett) in the smaller scales, 45 in the lateral line.

Widely distributed from the Red Sea and East Indies to Japan and Fiji.

Dussumieria acuta Valenciennes.

Dussumieria acuta Valenciennes: Hist. nat., Poiss., vol. 20, p. 343, pl. 606, 1847 (type loc., Coromandel).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 278, 1883 (Hood Bay, New Guinea).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 2, p. 21, fig. 13, 1913 (Waigiu; New Guinea).

Dussumieria elopoides Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).

Dorsal origin about midway between hind eye edge and caudal base. Reaches 165 mm. The anal rays are more numerous (15 to 17) than in *Stolephorus*.

Ranges from Southern Arabia to the East Indies and China.

Hilsa brevis (Bleeker).

Alosa brevis Bleeker: Ind. Arch., Jour., vol. 2, p. 638, 1848 (type loc., Bima, Sumbawa).

Clupea platygaster Regan: Zool. Soc. London, Trans., vol. 20, pt. 6, p. 276, 1914 (Mimika River, New Guinea).

Upper gill rakers not folded over the lower, 100 on lower part of first arch. Scales moderate, 40 to 50 longitudinally, 13 to 20 transversely. Length 140 mm.

East Indies.

Sardinella perforata (Cantor).

Clupeonia perforata Cantor: Asiatic Soc. Bengal, Jour. (Cat. Malay, fish.), vol. 18, p. 1276, 1849 (type loc., Sea of Pinang; Malayan Peninsula; Singapore; Sumatra).

Harengula (*Spratella*) *kowala* Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).

Clupea zunasi Schmeltz: Mus. Godeffroy, Cat. 4, p. 25, 1869 (Savay).

Depth 3. Gill rakers 48 to 55 on lower branch of first arch. Eye 3 1/3 to 3 2/3 in head. Length 150 mm.

Possibly *Clupea pilchardus* Thiollière (Fauna Woodlark, p. 208, 1857) may be this species. The short notice follows, Teniok of the natives: "Abdomen keeled and denticulated; ventrals nearly below middle of dorsal; anal short, near caudal; opercle cut truncate, marks of striae and venules distinguish it; mouth small; height somewhat less than 1/4 the length; silvery, back sea green, in some places blue; approaches the shores in April."

South Arabia to the East Indies and Samoa.

Sardinella jussieu (Lacépède).

Clupanodon jussieu Lacépède: Hist. nat., Poiss., vol. 5, pp. 469, 471, pl. 11, fig. 2, 1803 (type loc., Mauritius).

Clupea otaitensis (Solander) Valenciennes: Hist. nat., Poiss., vol. 20, p. 257, 1847 [name only].

Spratella fimbriata Schmeltz: Mus. Godeffroy, Cat. 4, p. 25, 1869 (Upolu).

Clupea tembang Schmeltz: Mus. Godeffroy, Cat. 5, p. 36, 1874 (Tonga).—Günther: Rept. voyage "Challenger," vol. 1, p. 36, 1880 (Levuka and Kandavu, Fiji).

Clupea gibbosa Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 381, 1909 (Ponape; Samoa; Tonga; Society Islands; Fiji).

Harengula sondaica Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 243, 1911 (Nukuhiva, Marquesas Islands).

Clupea exile Kishinouye, College Agriculture, Tokyo, Jour., vol. 2, p. 384, pl. 30, fig. 1, 1911 (type loc., Chichijma, Bonin Islands).

Depth 3 1/2 to 4. Eye 3 1/2 to 4 in head. Gill rakers 50 to 55 on lower part of first arch. Reaches 185 mm.

In the National Museum 25 from Nukahiva.

South Arabia and Zanzibar to the East Indies, China, Samoa and Tahiti.

Sardinella melanura (Cuvier).

Clupea melanura Cuvier: Règne animal, 2nd ed., vol. 2, p. 318, 1829 (on var. *Clupanodon jussieu* Lacépède: Hist. nat. Poiss., vol. 5, pl. 11, fig. 3, 1803, type loc., Tahiti).

Sardinella melanura Fowler: B. P. Bishop Mus., Bull. 22, p. 37, 1925 (Tahiti).

Clupeonia commersoni Valenciennes: Hist. nat., Poiss., vol. 20, p. 256, 1847 (type loc., Mauritius; Bombay).

Clupea commersonii Schmeltz: Mus. Godeffroy, Cat. 4, p. 25, 1869 (Upolu).

Harengula commersoni Jordan and Seale: (U.S.) Bur. Fish., Bull., vol. 25, p. 186, 1905 (1906) (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 244, 1911 (Vavau, Tonga Islands; Papeete, Tahiti; Suva, Fiji).

Clupea articauda Schmeltz: Mus. Godeffroy, Cat. 5, p. 37, 1874 (Upolu).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 387, 1909 (Samoa; Society Islands; Hervey Islands; Vanicolo?; Tahiti).

Sardinella atricauda Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 519, 1900 (Tahiti).—Fowler: op. cit., p. 206, 1911 (Tahiti).

Clupea (*Harengula*) *atricauda* Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1424, 1906 (Upolu).

Clupea ogura Kishinouye, College of Agriculture, Tokyo, Jour., vol. 2, p. 384, pl. 30, fig. 2, 1911 (type loc., Futani Harbor, Chichijma, Bonin Islands).

Head 3 2/5 to 3 3/5; depth 3 3/5 to 3 3/4; D. IV, 13, 1; A. III, 16, 1, to III, 18, 1; scales 39 or 40 in median lateral series to caudal base and 4 more on latter; 12 scales transversely between dorsal and ventral origins; 15 or 16 predorsal scales; ventral scutes 17 + 11 or 12. Body compressed, fusiform, deepest at dorsal origin. Caudal peduncle compressed, least depth 1 1/3 its length or 2 1/2 to 3 in head. Head width 2 1/2 its length. Snout convex, width 1 1/3 its length which 3 1/4 in head measured from upper jaw tip. Eye high, slightly advanced, 3 1/4 in head. Mouth moderate, evenly emarginate above. Maxillary reaches opposite pupil, 2 1/10 to 2 1/5 in head, expansion about 2/3 of eye diameter. No teeth. Mandible protruding beyond snout tip, deep. Nostrils small, together, little nearer snout tip than eye. Interorbital flat, 4 to 4 1/3 in head. Gill rakers 18 + 44, finely lanceolate, about 3/4 of eye; gill filaments about 2/3 of gill rakers, equal pseudobranchiae. Scales narrowly imbricate, with 1 to 5 transverse vertical striae, of which only one complete; circuli fine, vertically parallel. Pectoral depresses below horizontal ledge of scales and axillary ventral scale 3/5 of fin; dorsal and anal depressible in basal scaly flaps; caudal covered with small scales basally. Dorsal origin midway between mandible tip and caudal base; first branched ray

1 3/4 in head. Anal inserted well behind depressed dorsal, low. Caudal forked. Pectoral 3/4 to ventral, 1 1/2 in head. Ventral inserted trifle behind dorsal origin, reaches 2/5 to anal, fin 2 1/10 in head. Back neutral slaty or bluish, with violet reflections, otherwise largely silvery-white. Mandible tip and upper snout tip deeper brown than slaty tint of head above. Iris and sides of head white. Fins pale or whitish, dorsal and caudal slightly darker and tips of caudal lobes broadly blackish. Length 102 mm. Reaches 160 mm.

Three in the Academy from Tahiti obtained by Garrett. One from Papeete and six from Suva in the National Museum. In the Agassiz Museum 1 from the Society Islands through Andrew Garrett and 7 from Nukahiva, Marquesas Islands.

Widely distributed from Mauritius to the East Indies, Samoa, and Tahiti.

Sardinella sirm (Walbaum).

Clupea sirm Walbaum: Artedi Piscium, pt. 3, p. 38, 1794 (on Forskål, Descriptiones animalium, p. 17, no. 44, 1775, type loc., Arabia).—Günther: Mus. Godeffroy, Jour., vol. 16, pt. 8, p. 383, 1909 (Kingsmill Islands).

Sardinella sirm Jordan and Seale: (U.S.) Bur. Fish., Bull., vol. 25, p. 186, 1905 (1906) (Apia).

Belly obtuse, with weak ventral scutes. Gill rakers 36 to 40 on lower half of first arch. Reaches 185 mm.

Ranges from the Red Sea and Mozambique to the East Indies, Kingsmill Islands, and Samoa.

Harengula koningsbergeri (Weber and Beaufort).

Clupea (*Harengula*) *koningsbergeri* Weber and Beaufort: Akad. Amsterdam, Verh., vol. 17, pt. 3, p. 14, 1912 (type loc., Aru Islands).

Harengula koningsbergeri Regan: Ann. Mag. Nat. Hist., 8th ser., vol. 19, p. 390, 1917 (New Guinea).

Depth 2 2/3. Gill rakers 33 on lower part of first arch. Scales 42. Reaches 115 mm.

Northwest Australia and New Guinea.

Harengula punctata (Rüppell).

Clupea punctata Rüppell: Neue Wirbelth., Fisch., p. 78, pl. 21, fig. 2, 1835 (type loc., Red Sea).

Harengula punctata Regan: Ann. Mag. Nat. Hist., 8th ser., vol. 19, p. 390, 1917 (Indo-Pacific; Paumotu).—Whitley: Australian Mus., Records, vol. 16, no. 1, p. 4, 1927 (Giza, Solomon Islands).

Clupea moluccensis Günther: Rept. voyage "Challenger," vol. 1, p. 57, 1880 (Nares Harbor, Admiralty Islands).

Clupea (*Harengula*) *moluccensis* Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 2, p. 81, fig. 28, scale, 1913 (Waigiu).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 97, 1913 (Saonek).

Harengula stereolepis Ogilby: Linn. Soc. New South Wales, Proc., vol. 22, p. 759, 1897 (1898) (type loc., Torres Straits; Darnley Island; Southeast New Guinea).

Sardinella kunzei Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 5, 1906 (Faté, New Hebrides; Shortland Island, Solomons).

Clupea kunzii Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 382, 1909 (compiled).

Harengula kunzei Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 243, 1911 (Jaluit, Marshall Group; Suva, Fiji).

Clupea venenosa Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 42, 1885 (Rubi, New Guinea).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 2, p. 77, 1913 (New Guinea).

Head 3 1/2 to 3 2/3; depth 3 4/5 to 4 1/8; D. IV, 14, I; A. II, 14, I or II, 16, I; scales 43 or 44 in median lateral series to caudal base; 10 or 11 scales transversely; 13 or 14 predorsal scales; snout 3 1/2 in head measured from upper jaw tip; eye 3 1/5 to 3 2/5; maxillary 2 to 2 1/10; interorbital 4 1/5 to 4 3/5; abdominal scutes 19 + 12 or 13. Gill rakers 14 + 32, finely lanceolate, 7/8 of gill filaments, which 1 4/5 in eye. Deep notch on inner edge of gill opening receives ends of branchiostegals. Scales adherent, with 5 or 6 vertical striae, sometimes 2 or 3 more incomplete marginals. Dull brown, sides and lower surface little paler. Fins pale. Length 112 to 135 mm.

In the Bishop Museum 2 from Faté and 3 from Shortland Island. In the National Museum 2 from Jaluit and 72 from Suva. The Agassiz Museum has 14 from Suva, Fiji, obtained by the *Albatross*.

Noticed by Jouan in New Caledonia (Soc. Sci. Nat. Cherbourg, Mem., vol. 8, p. 307, 1861).

Harengula vittata (Valenciennes).

Clupeonia vittata Valenciennes: Hist. nat., Poiss., vol. 20, p. 257, 1847 (type loc., Vanikoro).

Harengula vittata Regan: Ann. Mag. Nat. Hist., 8th ser., vol. 19, p. 392, 1917 (Raiatea).

Alausa melanura (not *Clupea melanura* Cuvier) Valenciennes: Hist. nat., Poiss., vol. 20, p. 324, 1847 (type loc., New Guinea; Amboina; Vanikoro; Bourbon).

Clupea (*Harengula*) *melanurus* Bleeker: Atlas ichth., vol. 6, p. 111, pl. (11) 269, fig. 5, 1866-72 (New Guinea).

? *Clupea latulus* (non Valenciennes) Thiollière: Fauna Woodlark, p. 207, 1857 (Woodlark Island).

Harengula (*Paralosa*) *valenciennesi* Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).

Clupea rechingeri Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1424, 1906 (type loc., Upolu).

Harengula vanicoris Jordan and Seale: (U.S.) Bur. Fish., Bull., vol. 25, p. 187, 1905 (1906) (on *Alausa melanura* Valenciennes).

Depth 3 1/3 to 3 2/3. Gill rakers 50 on lower part of first arch. Ends of caudal lobes blackish. Length 140 mm.

Madagascar to the East Indies, Raiatea, Vanikoro and Samoa.

Harengula fijiensis Fowler and Bean.

Harengula fijiensis Fowler and Bean: U. S. Nat. Mus., Proc., vol. 63, p. 3, 1923 (type loc., Fiji).

Distinguished by the very fine gill rakers, 70 on the lower branch of the first arch.

Clupeoides lile (Valenciennes).

Meletta lile Valenciennes: Hist. nat., Poiss., vol. 20, p. 278, 1847 (type loc., Malabar; Coromandel; Pondicherry).

Rogenia argyrotaenia Kner: Reise "Novara," Fisch., vol. 1, pt. 5, p. 328, 1865 (Tahiti).

Harengula chrysotaenia Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 187, 1905 (1906) (type loc., Tahiti; East Indies).

D. 15 or 16; A. 18. Dorsal origin nearer snout tip than caudal base. Postventral scutes 11. Length 90 mm.

Western India to East Indies and Tahiti.

Clupeoides papuensis (Ramsay and Ogilby).

Corica papuensis Ramsay and Ogilby: Linn. Soc. New South Wales, Proc., 2nd ser., vol. 1, p. 19, 1886 (type loc., Strickland River, New Guinea).

D. 12 to 14; A. 21. Dorsal origin midway between snout tip and caudal base. Postventral scutes 7. Length 91 mm.

Southern New Guinea.

DOROSOMIDAE

Clupanodon punctatus (Schlegel).

Chatoessus punctatus Schlegel: Fauna Japonica, Poiss., pts. 10-14, p. 240, pl. 109, fig. 1, 1846 (type loc., bays or coast of southwest Japan).—Kner: Reise "Novara," Fisch., vol. 1, pt. 5, p. 336, 1865 (Tahiti).

Head 3 2/3 to 4 1/3. Depth 3 to 3 1/2. Dorsal 16 to 18. Scales 53 to 58 in median lateral series. Length 200 mm.

China, Japan, Tahiti.

Clupanodon thrissa (Linné).

Clupea thrissa Linné: Systema nat.,10th ed., p. 318, 1758 (type loc., Indian Ocean).

Chatoessus nasus Ramsay and Ogilby: Linn. Soc. New South Wales, Proc., vol. 1, pt. 2, p. 8, 1886 (Strickland River, New Guinea).

Head 3 1/2; depth 2 2/3 to 3. Dorsal 15 or 16. Scales 48 in median lateral series. Length 220 mm.

South Arabia to East Indies and New Guinea.

Anodontostoma chacunda (Buchanan-Hamilton).

Clupanodon chacunda Buchanan-Hamilton: Fishes of Ganges, pp. 246, 383, 1822 (type loc., Gangetic Estuaries).

Chatoessus chacunda Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 593, 1882 (New Guinea).

? *Chatoessus breviceps* Peters: Akad. Wiss. Berlin, Monatsb., p. 848, 1876 (1877) (type loc., New Hannover).

Differs from *Clupanodon thrissa* and *C. punctatus* in that the last dorsal ray is not produced. Head 3 1/3 to 4; depth 2 to 2 1/2. Dorsal 17 to 19. Scales 40 to 42 in lateral series. Length 165 mm.

India to New Guinea.

ENGRAULIDAE

Engraulis baelama (Forskål).

Clupea baelama Forskål: Descriptiones animalium, p. 72, 1775 (type loc., Djedda, Red Sea).

Engraulis boelama Pellegrin: Mus. Hist. Nat. Paris, Bull., vol. 4, p. 228, 1898 (Guam).

Engraulis encrasicholoides Schmeltz: Mus. Godeffroy, Cat. 4, p. 25, 1869 (Savay).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 593, 1882 (New Guinea).—Macleay: op. cit., vol 8, p. 278, 1883 (Hood Bay, New Guinea).

Anchovia evermanni Jordan and Seale: (U.S.) Bur. Fish., Bull., vol. 25, p. 188, fig. 4, 1905 (1906) (type loc., Apia, Samoa).

Engraulis evermanni Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 379, 1909 (New Pomerania).

No abdominal prepectoral scutes. Anal behind dorsal. Gill rakers 20 on lower branch of first arch.

Two specimens in the National Museum from New Guinea, 117 and 133 mm. long.

The variations easily include the nominal *Anchovia evermanni* Jordan and Seale.

Distribution from Madagascar to the East Indies, Guam, Samoa, and New Pomerania.

Engraulis scratchleyi Ramsay and Ogilby.

Engraulis scratchleyi Ramsay and Ogilby: Linn. Soc. New South Wales, Proc., 2nd ser., vol. 1, p. 18, 1886 (type loc., Strickland River, New Guinea)—Weber: Nova Guinea, vol. 9, pt. 4, p. 517, 1913 (Lorentz River at Bivak Island, Regen Island, and Alkmaar).—Regan: Zool. Soc. London, Trans., vol. 20, pt. 6, p. 276, 1914 (Mimika River, New Guinea).

Keeled ventral scutes complete. Anal behind end of dorsal. Maxillary not reaching gill opening. Anal 34 to 41. Scales 38 to 43 in lateral series. Length 350 mm.

Southern New Guinea.

Engraulis macrops Kishinouye.

Engraulis macrops Kishinouye: College Agri. Tokyo, Jour., vol. 2, p. 385, pl. 30, fig. 3, 1911 (type loc., Hahajima, Bonin Islands).

Keeled ventral scutes 6 and 7. Anal behind base of dorsal. Maxillary reaches preopercle angle. Anal 32. Scales 40 in lateral series. Length 120 mm. (Kishinouye)

Engraulis mystax (Schneider).

Clupea mystax Schneider: Systema ichth., Bloch, p. 426, pl. 83, 1801 (type loc., Malabar).

Maxillary reaches about first fourth in pectoral. Keeled scutes extend from isthmus to vent, 18 + 12. Gill rakers 11 + 15. Dorsal origin very slightly beyond last dorsal ray base. Length 195 mm.

One in the National Museum obtained by Stimpson in the Bonin Islands.

Previously known from India to China and the East Indies.

Engraulis purava (Buchanan-Hamilton).

Clupea purava Buchanan-Hamilton: Fishes of Ganges, pp. 238, 382, 1822 (type loc., Ganges Estuaries).

Closed front end of mandible vertically inclined, but little behind snout tip in vertical. Maxillary extends slightly beyond gill opening, though not quite to pectoral origin. Gill rakers 10+12. Abdominal scutes 5+7+12. Anal origin opposite hind basal edge of dorsal; length of fin 2 2/3 to caudal base; rays 11, 38.

One, 165 mm. long, in the National Museum obtained by Stimpson in the Bonin Islands. It seems to agree so well with Day's figure that I hardly believe it to be the *Engraulis purava* of Weber and Beaufort, who give the gill rakers as 17.

Possibly *Engraulis samam* Thiollière (Fauna Woodlark, p. 209, 1857) from Woodlark Island may have been intended for *E. purava*. Its imperfect description follows:

Depth 5 1/2 in total with caudal; head longer than body depth; snout pointed; eye near end of snout; maxillary not prolonged; mouth with numerous teeth; opercle and preopercle oblique; lateral line well marked; abdomen denticulated, semicircular; dorsal elevated, median, not passing anal origin; anal nearly twice dorsal, higher forward, somewhat distant from caudal; pectoral low, end passing ventral base; ventrals before dorsal; color silvery, without blue and green of other species; ends of dorsal and caudal reddish and somewhat reddish above gill opening; length 102 mm.

Engraulis setirostris (Broussonet).

Clupea setirostris Broussonet: Tableau ichth., no pagination, pl. 2, 1782 (type loc., Pacific Ocean near Tanna Island).

Engraulis setirostris Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 379, 1909 (on Forster).

Clupea mystacina (Forster) Schneider: Systema ichth., Bloch, p. 428, 1801 (name in synonymy).—Lichtenstein: Descriptiones animalium, Forster, p. 295, 1844 (type loc., Tanna Island).

Maxillary reaching beyond ventrals, often to anal. Anal 34 to 38. Gill rakers 12 on lower limb of first arch. Scales 40 to 44 in median lateral series. Length 170 mm.

East Africa and Red Sea to the East Indies, China and Tanna.

Engraulis dussumieri Valenciennes.

Engraulis dussumieri Valenciennes: Hist. nat., Poiss., vol. 21, p. 50, 1848 (no type locality).

Maxillary nearly reaches ventral origin or about 4/5 length of depressed pectoral. Anal origin opposite base of last dorsal ray and length of fin 2 3/4 to caudal base. Gill rakers 15 + 17. Length 108 mm.

One in the National Museum obtained by Stimpson at the Bonin Islands.

The previous range of this species was from India through the East Indies.

Engraulis apiensis (Jordan and Seale).

Anchovia apiensis Jordan and Seale: (U.S.) Bur. Fish., Bull., vol. 25, p. 187, fig. 3, 1905 (1906) (type loc., Apia, Samoa).

Engraulis apiensis Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 378, 1909 (Samoa).

Head 4 1/2; depth 5; eye 3 1/5 in head. Series of keeled abdominal scutes. Anal I, 20. Scales 34 in lateral series. Gill rakers 30 on lower limb of first arch. Maxillary reaches hind preopercle edge. Length 77 mm.

The type of *Anchovia apiensis* examined in the National Museum.

Engraulis purpureus (Fowler).

Stolephorus purpureus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 497, pl. 19, fig. 1, 1900 (type loc., Hawaiian Islands).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 8, 1922 (Hawaii).

Anchovia purpurea Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 432, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 521, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 60, fig. 12, 1903 (1905) (Honolulu; Hilo; Kailua).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 214, 1911 (types Hawaiian islands).—Fowler: Copeia, no. 112, p. 82, Nov. 20, 1922 (Hawaii).

Engraulis purpureus Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 78, 1909 (Hawaiian islands).—Fowler: B. P. Bishop Mus., Bull. 22, p. 23, 1925 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 38, p. 5, 1927 (Honolulu).

Head 3 1/3 to 3 3/4; depth 5 to 5 3/4; D. III, 10, 1 to III, 12, 1; A. III, 14, 1 or III, 15, 1; scales 38 to 41 in medial lateral series to caudal base and 3 more on latter; 9 or 10 scales transversely; 19 to 21 predorsal scales; snout 4 or 5 in head; eye 3 1/3 to 4; maxillary 1 1/5 to 1 2/5; interorbital 4 1/4 to 4 3/4. Body well compressed, belly rounded. Maxillary toothed, not quite reaches mandible base. Gill opening forward opposite front of eye. Gill rakers 21 + 21, fine, 1 1/5 in eye. Scaly axillary pectoral flap 1 1/2 in fin. Dorsal origin midway between front eye edge and caudal base. Anal inserted immediately after dorsal base. Caudal forked, lobes about equal, pointed. Pectoral reaches 2/3 to ventral. Broad silvery-white lateral band equals eye in width.

One in the Bishop Museum from Honolulu. On December 24, 1922, I saw about a bushel of dried specimens in the Honolulu market, valued as bait for the aku. In the Academy, the types of *Stolephorus purpureus,* 2 specimens 55 and 88 mm. long, obtained by Jones in Hawaii. Also 9 from Kahului and 7 from Hawaii. In the Agassiz Museum a series from Honolulu, of which 12 through Andrew Garrett and 9 through Stanford University.

Engraulis mauii (Fowler and Bean).

Anchovia mauii Fowler and Bean: U. S. Nat. Mus., Proc., vol. 63, p. 4, 1923 (type loc., Maui).

Differs from the other Hawaiian species, *Engraulis purpureus,* in more numerous gill rakers, 40 on lower branch of first arch, and the maxillary reaching the mandibular articulation or the preopercle ridge.

Engraulis indica Van Hasselt.

Engraulis indica Van Hasselt: Algem. Konst-en Letterbode, p. 329, 1823 (type loc., Java).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1424, 1906 (Upolu).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 377, 1909 (Tahiti).

Engraulis samam inan Thiollière: Fauna Woodlark, p. 208, 1857 (type loc., Woodlark Island).

Maxillary reaches preopercle ridge. Anal 19 to 21, begins below middle of dorsal. Scales 40 in median lateral series. Bright silvery lateral band. Gill rakers 20 on lower limb of first arch. Length 145 mm.

Jouan describes as *Engraulis* (Soc. Cherbourg, Mem., vol. 8, p. 307, 1861), an unidentified species from Kanala, New Caledonia: D. 16; A. 10. Abdomen carinate, somewhat dentate. Caudal very forked. Gray. Longitudinal silvery band on flanks. Length, 80 mm.

India to East Indies, Japan, Samoa, and Tahiti.

OSTEOGLOSSIDAE

Scleropages leichardti Günther.

Scleropages leichardti Günther: Ann. Mag. Nat. Hist., 3rd ser., vol. 14, p. 196, 1864 (type loc., Burdekin River, Queensland; Princhester, 90 miles from Rockhampton).—Weber: Leyden Mus., Notes, vol. 32, p. 226, pl. 3, 1910 (Digul River, Dutch New Guinea).—Weber: Nova Guinea, vol. 9, pt. 4, p. 516, 1913 (copied).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 2, p. 14, 1913 (copied).

Scales in lateral line 35, transversely 3 above and 4 below. Pectorals more than 1/4 length of body. Reaches 700 mm.

Known from Queensland, Australia. Weber and Beaufort state "the occurrence of this species in New Guinea is based on a photo."

GALAXIIDAE

Galaxias neo-caledonicus Weber and Beaufort.

Galaxias neo-caledonicus Weber and Beaufort: Zool. Anzeiger, vol. 42, p. 173, 1913 (type loc., Lake 8, fresh water, southern New Caledonia).—Weber and Beaufort: Nova Caledonia (Sarasin and Roux), Zool., vol. 2, pt. 1, p. 24, fig. 1, 1913 (types).

Said to differ from the other known species in the long head, which 1/3 of length to caudal base. Length 36 mm.

STOMIIDAE

Stomias boa (Risso).

Esox boa Risso: Ichth. Nice, p. 330, pl. 10, fig. 34, 1810 (type loc., Nice).

Stomias boa Peters: Akad. Wiss. Berlin, Monatsb., p. 846, 1876 (1877) (Pacific Ocean S. 42° 56′, W. 149° 26′ 3″).

Luminous organs 47 between pectoral and ventral, 11 between ventral and anal. Scales in lateral line 72 to 76. Length 270 mm.

Bathypelagic in the Atlantic and Pacific.

Stomias variegatus Lesson.

Stomias variegatus Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 142, 1830 (type loc., Baie Soledad, aux iles Malouines).

Body long, compressed and little elevated. Head short, conic. Snout obtuse. Eye very large, rounded. Mouth very small, lower jaw narrow, long. Teeth in maxillaries

sharp, slender, pointed. Opercle and preopercle smooth. No scales. Lateral line even, straight. Branchiostegals 4. Dorsal and anal same size, origins nearly opposite, widening at their hind edge. Dorsal rays 9; anal 12. Caudal long, narrow, evenly forked. Pectoral somewhat broad, small, rays 18. Ventral oblong, elongate, pointed, rays 7. Brilliant golden-yellow, with 3 rows of oval and oblong brown spots along each side and not separated by narrow yellow intervals. All fins gray. Length 89 mm. (Lesson).

Found in fucus on the beaches.

Leptostomias macronema Gilbert.

Leptostomias macronema Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 607, pl. 72, fig. 3, 1903 (1905) (type loc., near Niihau in 319 to 451 fathoms).

Snout twice eye. Barbel nearly reaches ventral. No scales. Luminous organs 42 between pectoral and ventral, 16 between ventral and anal. Length 74 mm.

Type in the National Museum, from near Niihau, August 12, 1902.

GASTROSTOMIDAE

Gastrostomus pacificus B. A. Bean.

Gastrostomus pacificus B. A. Bean: Smithsonian Misc. Coll. (Quart. Issue), vol. 45, p. 254, fig. 31, April 11, 1904 (type loc., N. Lat. 12° 43′ 15″, W. Long. 145° 49′ in 5269 fathoms [near Guam]).

Type examined in the National Museum, taken June 1899 by *U. S. S. Nero.*

ASTRONESTHIDAE

Astronesthes lucifer Gilbert.

Astronesthes lucifer Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 605, pl. 71, fig. 3, 1903 (1905) (type loc., off Kauai in 1021 fathoms; off southern Oahu in 257 to 294 fathoms).

Eye more than 5 1/2 in head. Luminous organs 38 in lateral series. Length 75 mm.

East Indies to Hawaii.

CHAULIODONTIDAE

Chauliodus dentatus Garman.

Chauliodus dentatus Garman: Mus. Comp. Zool., Mem., vol. 24, p. 273, 1899 (type loc., Society Islands).

Head 6 1/5; depth (of head) 7 4/5; D. 18; A. 21; P. 6; V. 5; snout 4 in head measured from upper jaw tip; eye 4; maxillary 1; interorbital 5.

Body slender, compressed, tapering down gradually from head. Caudal peduncle well compressed, least depth 4 in head, measured from upper jaw tip. Head width about 1/3 its total length. Snout short, conic. Eye anterior, its hind edge midway in head length measured from snout tip; diameter equals snout, little greater than interorbital. Mouth enormous, mandible large and protruding. Maxillary extends well back in head, expansion about half of eye. Upper teeth with 5 long, slender fangs on each side, of these second pair largest or slightly longer than eye; each maxillary with about 14, compressed, lanceolate teeth, alternating as many small ones crowded in between basally and all more or less inclined posteriorly; row of few small teeth on each palatine, none on vomer; mandible with pair of enormous fangs anteriorly at least twice diameter of eye, then pair less than 1/3 as short, then third pair little less than 1/2 as short, then 3 small pairs and finally 7 short low uniform pointed teeth. Nostrils together, close before eye. Interorbital convexly elevated, with median depression. Gill rakers as obsolete, short, feeble papillae; gill filaments 1 1/5 in eye. Scales very thin, most all fallen (estimated by Garman as 64 in lateral line). Photophores of lower series as 8 branchiostegals, pectorals 29, ventrals 14; upper series with pectorals 19, ventrals 29. Luminous body below hind half of pupil of eye. Dorsal begins close behind pectoral base.

Color dusky-brown, nearly uniform.

In the Agassiz Museum the type, from the Society Islands, obtained by Andrew Garrett. Length 197 mm. (broken, though entirely reconstructed).

GONOSTOMIDAE

Cyclothone canina Gilbert.

Cyclothone canina Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 604, pl. 71, fig. 2, 1903 (1905) (type loc., off Kauai in 480 to 577 fathoms; Kauai in 368 to 1021 fathoms; Kaiwi Channel in 449 to 460 fathoms; between Oahu and Kauai in 743 to 1218 fathoms; Bird Island in 636 to 850 fathoms; Niihau Island in 417 to 426 fathoms).

Three pairs of slender canines near the mandibular symphysis. Row of about 100 teeth along each mandibular ramus. Lenth 68 mm.

Series of Hawaiian specimens in the National Museum examined.

Cyclothone atraria Gilbert.

Cyclothone atraria Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 605, pl. 72, fig. 2, 1903 (1905) (type loc., off Kauai in 508 to 703 fathoms).

Anteriorly on each side of mandible 2 wide-set canines. Length 53 mm.

Possibly not distinct from *Cyclothone canina.*

Type in the National Museum, from off Kauai, obtained August 13, 1902.

Gonostoma elongata Günther.

Gonostoma elongata Günther: Ann. Mag. Nat. Hist., 5th ser., vol. 2, p. 187, 1878 (type loc., south of New Guinea in 800 fathoms).

Vomer edentulous. No scales. Dorsal and anal origins opposite. Lenth 190 mm.

Bathypelagic in the Atlantic and Indian Oceans, East Indies.

Gonostoma rhodadenia (Gilbert).

Cyclothone rhodadenia Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 602, pl. 71, fig. 1, 1903 (1905) (type loc., Kaiwi Channel in 411 to 442 fathoms; off Kauai in 409 to 550 fathoms).

Vomer with pair of teeth hooked backward. Very thin, partly concealed large scales present. Dorsal origin above second or third anal ray. Length over 190 mm.

East Indies to Hawaii.

IDIACANTHIDAE

Idiacanthus fasciola Peters.

Idiacanthus fasciola Peters: Akad. Wiss. Berlin, Monastb., p. 847, 1876 (1877) (type loc., north of Australia in East Long. 117°; north of New Guinea N. Lat. 1° 4′ 5″, E. Long. 136° 3′ 6″).

Ventral luminous bodies 34 to 36 between isthmus and ventral fin, 16 or 17 between ventral and anal. Dorsal 63 to 67, begins well before ventral. Anal 41 to 45. Length 180 mm.

Seychelles to East Indies.

MAUROLICIDAE

Vinciguerria attenuata (Cocco).

Scopelus or *Maurolicus attenuatus* Cocco: Nuovi Ann. Sci. Bologna, vol. 2, p. 193, pl. 8, fig. 3, 1838 (type loc., Messina).

Zalarges nimbarius Jordan and Williams: California

Acad. Sci., Proc., p. 793, 1895 (type loc., northeast of Hawaii).

Vinciguerria lucetia Gilbert: Mus. Comp. Zool., Mem., vol. 26, no. 6, p. 237, 1908 (near Marquesas Islands).

Dorsal origin in middle of length, before that of anal. Teeth on palatines. Length 50 mm.

Three from Cape Martin, Nukuhiva Island, on September 15, 1899, in the National Museum.

Tropical seas.

Argyripnus ephippiatus Gilbert and Cramer.

Argyripnus ephippiatus Gilbert and Cramer: U. S. Nat. Mus., Proc., vol. 19, p. 414, pl. 39, fig. 2, 1897 (type loc., N. Lat. 21° 12′, W. Long. 157° 49′ in 295 fathoms).—Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 601, 1903 (1905) (off Maui; Oahu; 216 to 283 fathoms).

Differs from *Maurolicus* in the longer anal fin, the dorsal before middle in total length, likewise front of anal. Length 90 mm.

STERNOPTYCHIDAE

Sternoptyx diaphana Hermann.

Sternoptyx diaphana Hermann: Naturforscher, no. 16, p. 133, pl. 1, figs. 1-2, 1781 (no type locality).—Gmelin: Systema nat. Linné, p. 1150, 1789 (America).—Gilbert and Cramer: United States Nat. Mus., Proc., vol. 19, p. 416, 1897 (N. Lat. 21° 15′, W. Long. 157° 30′ in 313 fathoms).—Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 609, 1903 (1905) (off Molokai; Oahu; Kauai; Kaiwi Channel; Bird Island; 295 to 1594 fathoms).

Under section of body, between trunk and tail, filled by transparent integumentary plate. Eyes normal. Anal not divided. Length 45 mm.

Five Hawaiian specimens in the National Museum.

Tropical seas, widely distributed.

Argyropelecus heathi Gilbert.

Argyropelecus heathi Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 601, pl. 72, fig. 1, 1903 (1905) (type loc., Kaiwi Channel, between Oahu and Molokai, 350 to 355 fathoms).

Differs from *Sternoptyx diaphana* in the absence of a gelatinous abdominal plate, divided anal and telescopic eyes.

One specimen in the Bishop Museum from Alika, District of Kau, Hawaii, October, 1919, from T. Reinhardt. Length 25 mm. Agrees very well with Gilbert's account and figure. It shows the dorsal spines well developed and its pectoral at least twice the eye diameter. In very poor state of preservation.

Diplophos pacificus Günther.

Diplophos pacificus Günther: Rept. voyage "Challenger," vol. 31, pt. 2, p. 33, pl. 4, fig. B, 1888 (1889) (type loc., N. Lat. 5° 54′, W. Long. 147° 2′ in mid-Pacific).

Head 5 in total; depth 10; D. 12; A. 53; snout 3 times eye, which 7 or 8 in head; maxillary extends far behind eye, nearly to preopercle angle; cheek covered by enlarged suborbital. Photophores as in *Diplophos taenia*. Dorsal higher than body, origin nearer snout tip than caudal base, last rays opposite those of anal: anal nearly reaches caudal; ventral reaches dorsal origin, more than twice as remote from pectoral as from dorsal. Brownish, with silvery luster. Length 37 mm. (Günther.)

Polyipnus nuttingi Gilbert.

Polyipnus nuttingi Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 609, pl. 73, 1903 (1905) (type loc., approach to Pailolo Channel between Molokai and Maui in 297 to 324 fathoms; off Oahu; Kauai; in 216 to 324 fathoms).—Jordan: U. S. Nat. Mus., Proc., vol. 59, p. 646, 1921 (Hawaii).

Polyipnus spinosus (non Günther) Gilbert and Cramer: United States Nat. Mus., Proc., vol. 19, p. 416, 1897 (N. Lat. 21° 9′, W. Long. 157° 53′ in 298 fathoms).

Said to differ from *Polyipnus spinosus* in the larger eye, 2 1/5 in head (2 1/2 in *Polyipnus spinosus*) and longer and more slender caudal peduncle.

Series of cotypes, Hawaiian, in the National Museum. Also one from Alika, Hawaii, October 6, 1919.

HALOSAURIDAE

Halosauropsis kauaiensis Gilbert.

Halosauropsis kauaiensis Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 611, 1903 (1905) (type loc., Kauai in 724 to 804 fathoms; off Molokai; Bird Island; in 385 to 876 fathoms).

Aldrovandia kauaiensis Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, pl. 74, 1903 (1905) (error).

Vertex gently arched transversely. Snout little produced, preoral length less than 1/3 of preocular.

Two Hawaiian specimens in the National Museum.

Gigliolia mosleyi Goode and Bean (U. S. Nat. Mus., Proc., vol. 17, p. 465, pl. 18, fig. 1, 1894 [1895]) based on *Notacanthus bonapartii* (non Risso) Günther (Rept. voyage "Challenger," vol. 22, p. 249, pl. 61, fig. C, 1887) is from off the western coast of South America at 400 fathoms depth. Its inclusion in the fauna of Oceania, as admitted by Jordan and Seale, is therefore discarded.

Halosauropsis verticalis Gilbert.

Halosauropsis verticalis Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 611, 1903 (1905) (type loc., near Kauai in 437 to 632 fathoms; off Bird Island, in 313 to 800 fathoms).

Aldrovandia verticalis Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, pl. 75, 1903 (error).

Differs from *H. kauaiensis* in the transversely concave vertex.

Two Hawaiian specimens in the National Museum.

Halosauropsis proboscidea Gilbert.

Halosauropsis proboscidea Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 612, pl. 76, 1903 (1905) (type loc., Kaiwi Channel, between Molokai and Oahu in 460 to 470 fathoms; Kaiwi Channel and Kauai in 438 to 476 fathoms).

Aldrovandia proboscidea Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 612, pl. 76, 1903 (1905) (error).

Differs from *H. kauaiensis* and *H. verticalis* in the longer snout, which more produced beyond the mouth.

SYNBRANCHIDAE

Synbranchus bengalensis (McClelland).

Ophisternon bengalensis McClelland: Calcutta Jour. Nat. Hist., vol. 5, pp. 197, 200, pl. 11, fig. 1, 1845 (type loc., Bengal).

Synbranchus bengalensis Schmeltz: Mus. Godeffroy, Cat. 4, p. 27, 1869 (Pelew Islands).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 416, 1916 (Mimika River, New Guinea).

Symbranchus bengalensis Regan: Zool. Soc. London, Trans., vol. 20, pt. 6, p. 275, 1914 (New Guinea).

Symbrachus gutturalis Richardson: Voyage "Erebus" and "Terror," Ichth., p. 49, pl. 30, figs. 14 to 17, 1844-48 (type loc., Dampier's Archipelago).

Gill opening ventral, forms single narrow aperture, not extending on sides. Length 530 mm.

India and East Indies.

MURAENIDAE (Anguillidae auct.)

Muraena manillensis Bleeker.

Muraena manillensis Bleeker: Nederlandsch Tijds. Dierk., pt. 2, p. 31, 1865 (type loc., Manila).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Kandavu).

Anguilla manillensis Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 390, 1910 (Ponapé).

In *M. manillensis*, *M. reinhardti* and *M. mauritiana* the maxillary and mandibular band of teeth with a toothless longitudinal furrow. The *M. manillensis* with the mouth cleft not reaching the hind edge of the eye.

Muraena reinhardti (Steindachner).

Anguilla reinhardti Steindachner: Akad. Wiss. Wien, Sitz., vol. 55, p. 15, figs. (head), 1867 (type loc., Rockhampton, East Australia).—Ogilby: Linn. Soc. New South Wales, Proc., p. 765, 1887 (New Caledonia).—Weber: Zool. Jahrb. Suppl. (Festschr.), vol. 15, pt. 1, p. 575, figs. a-b, teeth, 1912 (New Caledonia).—Weber and Beaufort: Nova Caledonia (Sarasin and Roux), Zool., vol. 2, pt. 1, p. 21, 1913 (Tchalabel; Mont Ignambi; River Coné; Ciu; Coindé; La Foa).

Differs from *M. manillensis* in the mouth cleft reaching to or beyond the hind eye edge. Dorsal origin nearer the vent than the gill opening.

Muraena mauritiana (Bennett).

Anguilla mauritiana Bennett: Comm. Zool. Soc. London, Proc., p. 128, 1831 (type loc., Mauritius).—Günther: Cat. fishes Brit. Mus., vol. 8, p. 25, 1870 (type of *Anguilla johannae* Günther).—Günther: Rept. voyage "Challenger," vol. 1, pp. 37, 58, 1880 (fresh water of Levuka and Ovalau, Fiji; Lake Waihirra, Tahiti).—Pellegrin: Mus. Paris, Bull., vol. 4, p. 228, 1898 (Saypan, Mariannes).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 192, 1905 (1906) (Vaisigano River and Apia, Samoa).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1420, 1906 (waterfall of Papaseea, Upolu).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 390, 1910 (Pelew Islands; Samoa; Society Islands; Solomon Islands; Jaluit Islands).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 244, 1911 (Kusaie, Carolines).—Weber: Zool. Jahrb. Suppl. (Festschr.), vol. 15, sec. 1, p. 582, fig. b, 1912 (Polynesia).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 8, 1912 (Samoa).—Weber and Beaufort: Nova Caledonia (Sarasin and Roux), Zool., vol. 2, pt. 1, p. 21, 1913 (Col Porari et Balade; River Ngoi).—Pietschmann: Nassau. Ver. Nat., Jahrb. (Wiesbaden), pt. 66, p. 196, 1913 (Kaiser-Wilhelm's Harbor, New Guinea).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 245, fig. 100-102, 1916 (rivers Mamåpiri, Klipong Tawarin near Humboldt Bay, German New Guinea).—Fowler: B. P. Bishop Mus., Bull. 22, p. 4, 1925 (Guam), p. 31 (Samoa).

Anguilla labrosa Richardson: Voyage "Erebus" and "Terror," Ichth., p. 113, 1844-48 (type loc., South Seas).

? *Muraena anguilla* (non Linné) Lichtenstein: Descriptiones animalium, Forster, p. 257, 1844 (Tanna).

Anguilla fidjiensis Günther: Cat. fish. Brit. Mus., vol. 8, p. 26, 1870 (type loc., Kandavu, Fiji).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 37, 1874 (Kandavu; Tongatabu).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 390, 1910 (Viti Levu; Levuka; Kandavu; Nairai).

Anguilla bengalensis Schmeltz: Mus. Godeffroy, Cat. 5, p. 37, 1874 (Upolu).—Fowler: Acad. Nat. Sci. Philadelphia., Proc., p. 524, 1900 (Samoa).

Anguilla labiata Weber: Nova Guinea, vol. 5, pt. 2, p. 228, 1908 (Klipong River, northern New Guinea).

Differs from *Muraena reinhardti* in the dorsal origin nearer the gill opening than the vent.

One in the Bishop Museum, obtained at Guam in 1923. In the National Museum 3 from Samoa and 1 from Kusaie, also 1 without data, doubtless from Polynesia, last obtained by the Wilkes Expedition. In the Agassiz Museum 1 from Samoa, 2 from the Marshall Islands, 1 from Ascension Island, Marshall Islands, 1 from the Caroline Islands and 2 from the Society Islands, last obtained by Andrew Garrett. Largest 1045 mm. One in the Academy from Samoa.

Jouan notices a large eel as *Muraena* (Soc. Cherbourg, Mem., vol. 9, p. 105, 1863), 65 cm. long; blackish, with 2 small orange-red barbels, scarcely different from the common species of Europe and is not rare in the marshes near Port de France, New Caledonia.

Muraena celebesensis (Kaup).

Anguilla celebesensis Kaup: Cat. apodal fish Brit. Mus., p. 42, fig. 31, 1856 (type loc., Celebes).—Weber: Zool. Jahrb. Suppl. (Festschr.), vol. 15, sec. 1, p. 585, figs. c to f, 1912 (Mangareva; Austral Islands; Samoa; Cook Islands; Vavau; Tubicai; Marquesas; Tahiti; Aneiteum; Raiatea; Solomons; Roon Island).—Weber and Beaufort: Nova Caledonia (Sarasin and Roux), Zool., vol. 2, pt. 1, p. 21, 1913 (Mt. Panie).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 247, figs. 99, 101, 1916 (New Guinea).

? *Anguilla marmorata* Quoy and Gaimard: Voyage "Uranie," Zool., p. 241, pl. 51, fig. 2, 1824 (type loc., Waigiu).—Kner: Reise "Novara," Fische, vol. 1, pt. 5, p. 369, 1865 (Tahiti).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 25, 1869 (Samoa).

Anguilla megastoma Kaup; Cat. apodal fish Brit. Mus., p. 50, fig. 42, 1856 (type loc., "Megarava," Mulgrave Archipelago).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 5, 1906 (Rarotonga, Cook Islands).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 192, 1905 (1906) (Apia).

Anguilla otaheitensis Kaup: Geb. Nat. Hamburg, Abhandl., vol. 4, p. 17, pl. 2, fig. 2, 1860 (type loc., Tahiti).—Günther: Rept. voyage "Challenger," vol. 1, p. 58, 1880 (Lake Waihirra, Tahiti).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 390, 1910 (type; Raiatea and Treasury Islands, Solomons).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 244, 1911 (Papeete, Tahiti).

Anguilla aneitensis Günther: Cat. fishes Brit. Mus., vol. 8, p. 34, fig. [of teeth], 1870 (type loc., Aneiteum, New Hebrides).—Macleay: Linn. Soc. New South Wales, Proc., vol. 4, p. 64, 1879 (Solomons).—Günther: Rept. voyage "Challenger," vol. 1, p. 58, 1880 (Lake Waihirra, Tahiti).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 391, 1910 (Aneiteum, Vavu, Tahiti).

Anguilla obscura Günther: Zool. Soc. London, Proc., p. 673, 1871 (type loc., Kanathea, Fiji).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 392, 1910 (type).

Differs from all the preceding species in the maxillary and mandibular bands of teeth without longitudinal groove.

In the Bishop Museum 3 from Rarotonga and 3 from Tubuai, largest 583 mm. The Na-

tional Museum has 2 from Tahiti and 1 from Samoa. Also 1 in the Wilkes Collection without locality, likely from Polynesia. In the Agassiz Museum 6 from Papeete obtained by the *Albatross* and 13 from the Society Islands mostly through Andrew Garrett.

Muraena australis (Richardson).

Anguilla australis Richardson: Zool. Soc. London, Proc., p. 22, 1841 (type loc., Port Arthur, Tasmania, in fresh water).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 37, 1874 (Viti Levu).—Perugia: Mus. Genova, Ann., vol. 34, p. 553, 1894 (Inawi, New Guinea).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 192, 1905 (1906) (Vaisigano and Gasegase streams about Apia).—Weber: Zool. Jahrb. Suppl. (Festschr.), vol. 15, sec. 1, p. 593, fig. 4, 1912 (Samoa; Tahiti).—Weber: Nova Guinea, vol. 9, pt. 4, p. 551, 1913 (Lorentz River at Bivak Island).—Weber and Beaufort: Nova Caledonia (Sarasin and Roux), Zool., vol. 2, pt. 1, p. 20, 1915 (Oubatche, New Caledonia).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 249, 1916 (Lorentz River, Rigo, New Guinea).

Muraena australis Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Namusi).

Anguilla sidat Kner: Reise "Novara," Fische, vol. 1, pt. 5, p. 368, 1865 (Tahiti).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 192, 1905 (1906) (Apia).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 392, 1910 (Tonga).

Muraena sidat Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Samoa).

? Muraena malgomura (non Kaup) Schmeltz: Mus. Godeffroy, Cat. 4, p. 25, 1869 (Upolu).

Muraena halmaherensis Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Kandavu).

Anguilla halmaherensis Schmeltz: Mus. Godeffroy, Cat. 5, p. 37, 1874 (Kanathia).

Anguilla virescens Schmeltz: Mus. Godeffroy, Cat. 5, p. 37, 1874 (Savay).—Boulenger: Zool. Soc. London, Trans., vol. 2, pt. 12, p. 291, 1907-09 (1908) (Praslin).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 392, 1910 (Tahiti; Savay).

Dorsal origin about over vent. Mouth cleft reaches to or little beyond hind eye edge. Reaches 1000 mm. or more.

Natal, East Africa to East Indies and Tahiti.

SYNAPHOBRANCHIDAE

Synaphobranchus brevidorsalis Günther.

Synaphobranchus brevidorsalis Günther: Rept. voyage "Challenger," vol. 22, p. 255, pl. 63, fig. c, 1887 (type loc., north of New Guinea in 1070 fathoms; Hayalonema grounds off Japan in 345 fathoms).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 335, fig. 163, 1916 (north of New Guinea in 1957 m.).

Synaphobranchus brachysomus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 583, fig. 232, 1903 (1905) (type loc., off Kauai in 409 to 550 fathoms; off Bird Island; Oahu; in 222 to 8000 fathoms).

Gilbert shows the type of *Synaphobranchus brachysomus* with a larger mouth and longer pectoral than in Weber and Beaufort's figure of *Synaphobranchus brevidorsalis*.

Two typical examples of *Synaphobranchus brachysomus* Gilbert, from about Hawaii, in the National Museum.

MURAENESOCIDAE

Muraenesox cinereus (Forskål).

Muraena cinerea Forskål: Descriptiones animalium, pp. 10, 22, 1775 (type loc., Arabia).

Muraenesox cinereus Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 278, 1883 (Hood Bay, New Guinea).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 604, 1908 (Suva, Fiji).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 253, 1916 (Waigiu; South New Guinea).

Ophisurus rostratus Quoy and Gaimard: Voyage "Uranie," Zool., p. 242, pl. 51, fig. 1, 1824 (type loc., Rawak).

Outer row of teeth in mandibles not directed outwards; median canines of vomer with distinct anterior and posterior basal lobes. Length 800 mm. or more.

Eastern Africa to the East Indies, Japan, and Fiji.

Muraenesox talabonoides (Bleeker).

Conger talabonoides Bleeker: Bataviaasch Genoot., Verh. (Muraenoid.), vol. 25, p. 20, 1853 (type loc., Batavia, Java).

Rhechias armiger Jordan: U. S. Nat. Mus., Proc., vol. 59, p. 644, fig. 1, 1921 (type loc., Hawaii).

The type of *Rhechias armiger*, a poorly dried young specimen about 152 mm. long, from Hawaii, in the National Museum. It was one of the fishes evidently killed by the Mauna Loa lava flow in 1919, and obtained by T. Reinhardt. An examination of this specimen suggests it is the young of *Conger talabonoides* Bleeker of the East Indies. Its pectoral is nearly 1/4 of the head in length.

Found in India and the East Indies, reaching over 1000 mm.

CONGRIDAE

Conger cinereus Rüppell.

Conger cinereus Rüppell: Atlas Reise Nord. Afrika, Fische, p. 115, pl. 20, fig. 1, 1828 (type loc., Red Sea).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 258, figs. 107-108, 1916 (Humboldt and Hood bays, New Guinea).

Conger marginatus (Valenciennes) Eydoux and Souleyet: Voyage "Bonite," Zool., vol. 1, p. 201, pl. 9, fig. 1, 1841 (type loc., Hawaiian islands).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 37, 1874 (Kandavu).—Jouan: Soc. Cherbourg, Mem., vol. 21, p. 333, 1877-78 (New Caledonia).—Günther: Rept. voyage "Challenger," vol. 1, p. 61, 1880 (Honolulu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 278, 1883 (Hood Bay, New Guinea).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 514, 1901 (Laysan).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 393, 1910 (Hawaiian islands).—Fowler: Copeia, no. 112, p. 82, Nov. 20, 1922 (Hawaii).

Leptocephalus marginatus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 76, 1903 (1905) (Hilo; Kailua; Samoa).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 193, 1905 (1906) (Samoa).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 219, 1912 (Christmas Island; Hawaiian islands).

Conger nordziekii Schmeltz: Mus. Godeffroy, Cat. 4, p. 29, 1869 (Kandavu).

? Leptocephalus bimaculatus (Kner) Schmeltz: Mus. Godeffroy, Cat. 4, p. 27, 1869 (type loc., South Seas). [No description.]

Head 7 1/8 to 8 1/2; depth 15 3/4 to 23 1/2; snout 3 4/5 to 4 2/5 in head; eye 5 4/5 to 9 1/8; maxillary 2 1/4 to 2 2/3; interorbital 6 to 9; pectoral 2 3/4 to 3 3/5; head 2 1/2 to 2 2/3 to vent; depth 2 to 2 1/4 in head.

Body well compressed, combined head and trunk 1 3/4 to 2 in rest of body. Head width 2 2/5 to 3 1/8 in

its length. Snout elongate, conic, width 1 1/4 its length. Eye large, lateral, center about first third in head, 2 in snout. No eyelids. Gape large, nearly reaches hind eye edge. Lips broad, fleshy, lower wider. Snout protrudes half an eye diameter beyond mandible. Teeth uniserial in jaws laterally, close set, subequal, rather truncate. Patch of smaller and more conic teeth in front of each jaw and on vomer. Tongue pointed, free. Front nostril in short tube at snout tip. Hind nostril small pore close to front eye edge. Upper lip with 3 pores. Interorbital convex. Gill opening 1 1/4 in snout. Pores in lateral line 145 to 150, in largest examples. Dorsal origin about over first third of pectoral, height of fin in front about 2 4/5 in head; height of anal 4. Caudal rather pointed, about 2 1/6 in snout.

Olivaceous-brown above, becoming whitish below. Vertical fins all with submarginal blackish edge. Anal largely pale basally, like belly. Pectoral dusky medially above, otherwise whitish. Iris pale grayish. Length 1022 mm.

Five in the Bishop Museum from the Honolulu market. I examined 58 specimens of all ages in the Honolulu market during 1922-23. Two Hawaiian specimens in the Wilkes Collection in the National Museum, also 2 others from the same place received from the Bureau of Fisheries and 2 from Samoa. In the Academy 2 from Hawaii and 2 from Christmas Island. In the Agassiz Museum 6 from the Society Islands and 2 Hawaiian.

Jouan notices as (Soc. Cherbourg, Mem., vol. 8, p. 251, 1861) *Conger* a specimen 500 mm. long from Kanala, New Caledonia. Black on back, whitish below. Fins bordered black.

Red Sea to the East Indies and Hawaii.

Conger wilsoni (Schneider) (Pl. I, *C*).

Gymnothorax wilsoni Schneider: Systema ichth., Bloch, p. 529, 1801 (type loc., New Holland).

Conger wilsoni Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 375, 1923 (Honolulu).

Head 5 2/3 in total to caudal base; depth 10 1/8 to 14 4/5; snout 3 1/2 to 4 in head; orbit 6 4/5 to 8; maxillary 2 3/5 to 2 2/3; interorbital 5 1/5 to 7 1/4; head 2 1/3 to 2 1/2 to vent; depth 1 7/8 to 2 3/4 in head; pectoral 2 3/4 to 3; head 1 1/3 to 1 2/5 to dorsal origin, 2 2/5 to anal origin.

Body more or less cylindrical, robust, long tail compressed and tapering gradually and slenderly; head and trunk combined 1 1/3 to 1 3/4 in tail. Head massive, strong, attenuate, width 2 2/5 its length. Snout attenuated, about long as wide. Eye large, orbit 1 2/3 to 2 1/6 in snout. Mouth large, lower jaw but little shorter than upper, gape extending about to middle of eye or hind pupil edge. Maxillary concealed, extends back nearly or quite to hind eye edge. Lips wide, thick, fleshy. Jaws moderate. Teeth largely uniserial, uniform, strongly compressed, ends rounded, close-set, erect in jaws. In upper jaw 2 or 3 irregular rows of simple conic teeth, several each side slightly enlarged. Vomerine teeth like premaxillary, in somewhat rounded area and teeth little smaller and more sparse behind. No other upper teeth. Lower teeth not continued across symphysis and 3 more rows anteriorly and externally on each ramus. Tongue depressed, elongately triangular, smooth, free in front. Mandible shallow, strong, rami low. Front nostril in short or low fleshy tube near snout tip. Hind nostril simple pore close before front eye edge. Interorbital rather narrowly convex.

Gill opening begins little above middle of pectoral base, slightly longer than eye. Pharynx not swollen. Skin smooth. Pair of pores on upper lip at snout tip; 2 close-set pores above each nostril; 2 pores close above upper lip; one below hind nostril; one below front eye edge; one post-rictal; 6 pores on each mandibular ramus followed by 3 more back towards gill openings. Lateral line complete, little high at first, then midway along side of tail; from above pectoral origin about 128 pores in lateral line, of which 31 before vent; 5 pores before pectoral base, series not extended forward on head.

Dorsal and caudal continuous, first with origin close behind depressed pectoral tip. Dorsal and anal moderately high, radii fine. Caudal small, 2 1/3 in eye, with fine radii, contour pointed, median rays longest. Pectoral moderate, elongate, inserted about midway in depth, radii fine, about 18, pointed behind. Vent close before anal.

Largely uniform dark brown, even fins, though dorsal blackish marginally. Anal blackish, submarginally with narrow pale or whitish line.

Two adults in the Bishop Museum from the Honolulu market, 888 and 1520 mm. I also examined another specimen, 912 mm. long in the Honolulu market November 4, 1922.

The name *Gymnothorax wilsoni* Schneider has been restricted to the Australian conger. It is evident that my specimens agree largely with Waite's figure (South Australia Mus., Records, vol. 2, no. 1, p. 49, fig. 74, 1921). It also very closely approaches *Conger myriaster* (Brevoort) in the advanced dorsal. That species is said to have each pore of the lateral line in the center of a whitish spot, close-set and as wide as the interspaces. In my examples each pore of the lateral line is minute and whitish. Quite likely *Conger japonicus* Bleeker and *Leptocephalus riukiuanus* Jordan and Snyder are simply variants and therefore other synonyms.

Leptocephalus erebennus Jordan and Snyder (U. S. Nat. Mus., Proc., vol. 23, p. 849, fig. 13, 1901, Misaki, Japan) is also likely a synomym. The position of the origin of the dorsal fin is said to be variable, from slightly before the tip of the depressed pectoral until slightly posterior. The account is based on 3 specimens 354 to 760 mm. long.

Conger fidjiensis (Ogilby).

Congrellus fidjiensis Ogilby: Linn. Soc. New South Wales, Proc., vol. 23, p. 290, 1898 (type loc., Fiji).

Head 6 1/2; depth 17. Snout obtusely pointed, protrudes beyond mandible. Eye long as snout. Mouth-cleft to eye center; 2 2/5 in head. Teeth fine, cardiform, equal; maxillary and mandibulary triserial anteriorly, narrowed to single series behind; vomerine continuous with premaxillary, biserial forward, uniserial behind. Front nostril tubular; hind one slit close in front of eye. Dorsal begins well above pectoral base; predorsal 5 4/5 in total length. Pectoral 2 3/4 in head. Vent well before middle in total length. Uniform pale yellow. Length 152 mm. (Ogilby)

Perhaps synonymous with *Conger anago* Schlegel.

Conger neoguianicus Bleeker.

Conger neoguianicus Bleeker: Soc. Ind. Neerl., Act., no. 2, vol. 6, p. (5) 22, 1859 (type loc., Doreh, New Guinea).

Conger neoguinaicus Bleeker: Nat. Tijds. Ned. Ind., vol. 20, p. 93, 1859-60 (New Guinea).

Ophisoma neoguinaicum Bleeker: Atlas ichth., vol. 4, p. 28, 1864 (copied).

Congrellus neoguinaicus Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 263, 1916 (remarks).

Based originally on a poorly preserved specimen said to have the jaws of equal length, the vomerine teeth biserial and a diffuse silvery longitudinal lateral band.

Conger bowersi (Jenkins) (Pl. I, *D*).

Congrellus bowersi Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 422, fig. 1, 1902 (1903) (type loc., Honolulu).—Snyder: op. cit., p. 515, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 77, fig. 16, 1903 (1905) (Hilo; Honolulu).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 11, 1912 (Honolulu).

Congromuraena bowersii Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 394, 1910 (south of Gilbert Islands).

Congermuraena bowersii Fowler: Copeia, no. 112, p. 82, Nov. 20, 1922 (Hawaii).

Ariosoma bowersi Fowler: B. P. Bishop Mus., Bull. 22, p. 23, 1925 (Honolulu).

Conger bowersi Fowler: B. P. Bishop Mus., Bull. 38, p. 5, 1927 (Honolulu).

Head 4 3/4 to 6 1/2; depth 12 1/3 to 14 1/2; snout 4 to 4 2/3 in head; eye 4 to 4 3/4; mouth-cleft 2 4/5 to 3 2/5; interorbital 7 to 11; head width 3 1/4 to 3 2/3; pectoral 2 1/4 to 3; head less 1/12 to 1 1/10 to dorsal origin; head 1 1/2 to 1 7/8 to anal origin.

Tail moderately tapering, body well compressed. Head rather cavernous, profiles alike. Snout broadly convex, width 1 4/5 its length. Eye large, at first third in head. Mouth moderate, little inclined, rictus to first third in pupil. Fleshy lips wide laterally. Strong jaws with bands of minute pointed teeth, continuous above and

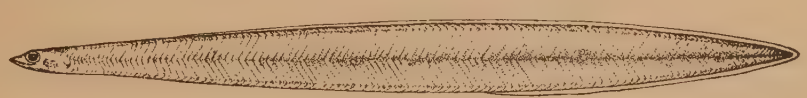

FIGURE 8.—Drawing of *Leptocephalus nuttalli*.

triangular area on vomer. Tongue free, pointed, smooth. Mandible shallow, tip little short of snout tip. Nostrils well separated, anterior in short tube and posterior at last third in snout as simple pore-like slit. Interorbital narrow, convex, bony ridge. Gill openings 1 1/4 to 1 1/2 in snout. Lateral line with about 127 pores. Dorsal origin slightly before that of pectoral. Caudal very narrow membrane around end of tail. Pectoral slender, rays fine.

Largely uniform pale brown, though belly and under surface lighter. Iris golden, with brownish ring. Dorsal and anal pale, only very narrow dark brown edge behind. Pectoral pale, uniform. Length 285 mm.

Five in the Bishop Museum from the Honolulu markets. In 1922 I examined over 600 specimens there, of all ages, where quantities of specimens may be seen most every day. Five in the National Museum from Honolulu, one the type of *Congrellus bowersi* Jenkins. One in the Academy from Honolulu. One Hawaiian specimen in the Agassiz Museum.

Differs from the other species in the nearly or quite even jaws and black bordered dorsal, anal and caudal fins.

Conger guttulata (Günther).

Congromuraena guttulata Günther: Rept. voyage "Challenger," vol. 22, p. 252, 1887 (type loc., Matuku, Fiji, in 315 fathoms).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 394, 1910 (type).

Congrellus guttulatus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 193, 1905 (1906) (Apia).

Congermuraena aequorea Gilbert and Cramer: U. S Nat. Mus., Proc., vol. 19, p. 405, pl. 37, 1897 (type loc., N. Lat. 21° 12′, W. Long. 157° 38′ 30″ in 375 fathoms).

Leptocephalus aequoreus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 584, 1903 (1905) (off Oahu; Kauai; in 164 to 469 fathoms).

This evidently falls in *Bathycongrus* of Ogilby, in which the premaxillary teeth are exposed in the upper jaw before the tip of the closed mandible.

One in the National Museum from Samoa.

Brachyconger platyrhynchus Norman.

Brachyconger platyrhynchus Norman: Ann. Mag. Nat. Hist. London, 9th ser., vol. 10, p. 218, fig. b, teeth, 1922 (type loc., New Britain).

Tail slightly longer than rest of fish; head little broader than deep, length 3/4 of trunk as measured from gill opening to vent; snout broad, flat, rounded anteriorly, nearly 1/6 of head and slightly more than eye; jaws equal, mouth cleft horizontal, reaches below hind eye edge; teeth universal in jaws and row on each palatine; front nostril almost at snout end, hind one labial and just before front eye edge. Dorsal and anal well developed, former begins behind gill opening space equal to 2/7 head length. Brownish, paler below. Caudal with very narrow pale margin. Length 130 mm. (Norman)

Leptocephalus nuttalli (Fowler) (fig. 8).

Atopichthys nuttalli Fowler: Acad. Nat. Sci. Philadelphia, Proc., vol. 64, p. 11, fig. 2, 1912 (type loc., Hawaiian islands).—Fowler: Copeia, no. 112, p. 82, Nov. 20, 1922 (Hawaii).

Larval specimen.

Leptocephalus taenia Lesson.

Leptocephalus taenia Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 126, 1830 (type loc., New Guinea).—Kaup: Cat. apodal fish Brit. Mus., p. 151, pl. 19, fig. 18, 1856 (Mariannes).—Bleeker: Atlas ichth., vol. 4, p. 122, pl. (48) 92, fig. 2, 1864 (copied).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 27, 1869 (South Seas).—Günther: Rept. voyage "Challenger," vol. 31, pt. 2, p. 42, 1888 (1889) (Admiralty Islands).—Weber: Siboga Exped., vol. 65, p. 64, 1913 (compiled).

Larval, with 106 to 115 segments.

Leptocephalus dussumieri Kaup.

Leptocephalus dussumieri Kaup: Cat. apodal fish Brit. Mus., p. 151, fig. 17, 1856 (type loc., Malabar).—Peters: Akad. Wiss. Berlin, Monatsb., p. 851, 1876 (1877) (Pacific Ocean).

A very small head; no teeth; transverse furrows very fine and not near each other; pointed tail without caudal fin; no pectorals; no fin rays. No dots on lateral line or edge of belly. (Kaup)

An imperfectly described larva.

Leptocephalus multimaculatus Steindachner.

Leptocephalus multimaculatus Steindachner: Akad.

Wiss. Wien, Sitz., vol. 60, pt. 1, p. 316, 1869 (1870) (type loc., Peru coast).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 38, 1874 (South Sea).

Leptocephalus sp.

Atopeichthys sp. Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 5, 1925 (Pearl and Hermes Reef).

Head very small, narrow. Body very compressed, uniformly deep nearly to tail. Eye large, very bright. Jaws equal. Teeth pointed. Muscular bands oblique, equal. Dorsal and anal each small, short, indistinct membrane. Caudal and paired fins absent. Length 90 mm. (Jouan)

Leptocephalus sp.

Head 5 1/2 to vent; head 10 to caudal base; depth 7 1/3 to vent, 16 1/2 to caudal base; dorsal origin 2 head lengths before anal origin. Length 55 mm.

This incomplete notice of a specimen from Kanala, New Caledonia (Soc. Cherbourg, Mem., vol. 9, p. 106, 1863). One in the Bishop Museum obtained at Fanning Island in 1922, by C. H. Edmondson.

Promyllantor alcocki Gilbert and Cramer.

Promyllantor alcocki Gilbert and Cramer: U. S. Nat. Mus., Proc., vol. 19, p. 405, pl. 36, fig. 1, 1897 (type loc., N. Lat. 21° 12′, W. Long. 157° 49′, in 295 fathoms).—Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 584, 1903 (1905) (off Molokai; Pailolo Channel; Oahu; in 238 to 334 fathoms).

Hind nostril above front part of eye; front one on lower surface of projecting snout.

Possibly not distinct from *Promyllantor purpureus* Alcock.

Poeciloconger fasciatus Günther.

Poeciloconger fasciatus Günther: Zool. Soc. London, Proc., p. 673, pl. 68, 1871 (type loc., Manado, Celebes).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 393, 1910 (Tahiti).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 267, fig. 115, 1916 (copied).

No canines, front nostrils not tubular and dorsal origin before gill openings. Head with large round brown spots; trunk with 5 or 6 and tail with 6 to 8 brown crossbands. Length 500 mm.

Veternio verus Snyder.

Veternio verus Snyder: U. S. Fish Comm., Bull., vol. 22, p. 516, pl. 2, fig. 3, 1902 (1904) (type loc., Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 79, pl. 5, fig. 1, 1903 (1905) (type).

Agrees with the *Congrellus* group in the insertion of the dorsal before the middle of the pectoral, but differs in the absence of teeth in jaws and on vomer.

Type of *Veternio verus* from Honolulu, in the National Museum. Besides this specimen I have seen a figure made by one of the artists of the Wilkes Expedition from a perfect specimen taken in the Hawaiian islands many years ago.

NETTASTOMIDAE

Metopomycter denticulatus Gilbert.

Metopomycter denticulatus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 585, fig. 233, 1903 (1905) (type loc., near Kauai, in 409 to 550 fathoms).

Differs from *Nettastoma* in the slit-like nostrils, which are situated over the middle of the eyes and converge toward the median line of the head. Only the type, 778 mm. long, is known.

ECHELIDAE

Muraenichthys macropterus Bleeker.

Muraenichthys macropterus Bleeker: Soc. Ind. Neerl., Act. (Amboyna), vol. 2, p. 91, 1857 (type loc., Amboyna).—Ogilby: Linn. Soc. New South Wales, Proc., vol. 22, p. 770, 1897 (New Caledonia).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 396, 1910 (Tongatabu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 396, 1905 (1906) (New Caledonia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 245, 1911 (Arno Atoll, Marshall Islands).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 275, 1916 (New Caledonia; Marshall Islands; Tongatabu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 5, 1925 (Guam).

Echidna uniformis Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 62, 1900 (1901) (type loc., Guam).

Head 8 to 8 1/8; depth 26 3/4 to 30; combined head and trunk 1 1/2 to 1 2/3 in tail; snout 5 to 5 1/6 in head; mouth-cleft 3 to 3 1/3 in head from upper jaw tip; interobital 9 3/4 to 10; head width 4 to 4 1/4; eye 1 3/4 to 2 1/4 in snout. Lower jaw much shorter than upper. Front edge of eye much nearer rictus than snout tip. Teeth biserial in jaws and on vomer, conic and though with broad bases somewhat suggestive of molars, tips at least sharp pointed. Interorbital convex. Dorsal inserted little nearer vent than snout tip. Caudal about long as eye. Ground-color pale brownish, back and upper surface finely dotted with darker. Iris slaty. Entire lower surface immaculate.

No. 46 to 48 Bishop Museum, types of *Echidna uniformis* Seale. Guam. 1900. Length 128 to 188 mm. Two from Guam in 1923, larger 225 mm. Four in the National Museum from Arno Atoll. Two in the Agassiz Museum, larger 100 mm. long, also from Arno Atoll. Although with but a single series of teeth in the jaws and on the vomer it varies from *Metopomycter denticulatus* only in characters of immaturity or more youthful growth.

Muraenichthys gymnopterus (Bleeker).

Muraena gymnopterus Bleeker: Bataviaasch Genoot. Verh. (Muraenoid.), vol. 25, p. 52, 1853 (type loc., Batavia, Java).

Muraenichthys gymnopterus Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Kandavu).—Schmeltz: op. cit., Cat. 5, p. 37, 1874 (Ovalau).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 396, 1910 (Kandavu).

? *Myropterura laticaudata* Ogilby: Linn. Soc. New South Wales, Proc., vol. 22, p. 247, 1897 (type loc., Fiji).

Head 9; depth 32; snout 4 4/5 in head; eye 11 1/2; maxillary 3; interorbital 9.

Head and trunk 2 2/5 in combined total length. Snout conic, width 1 1/5 in its length. Eye posterior in mouth cleft, which extends but slightly behind pupil; diameter 1 3/4 in snout. Lower jaw little shorter than upper. Premaxillary teeth somewhat arranged as in circle, about 6, little larger; 2 rows of teeth along sides of jaws; single row of small vomerine teeth; mandible with teeth larger in front, where also biserial, uniserial posteriorly. Front nostril in short tube about first third in snout; hind nostril short tube in upper lip, close before eye. Interorbital convex. Gill opening small, less than eye. Skin smooth. Dorsal origin before vent equal to space long as snout. Caudal narrow.

Generally dull prout's brown, under surface of head and belly paler. Iris neutral-slaty. Fins all pale. No markings. Length 154 mm.

In the Agassiz Museum 1 from the Hawaiian islands, obtained by Andrew Garrett.

The species *Muraenichthys hattae* Jordan and Snyder (U. S. Nat. Mus., Proc., vol. 23, p. 862, fig. 12, 1901), described from Wakanoura, Japan, is likely a synonym, though it is said to have the mouth-cleft extending well beyond the eye.

Differs from *Muraenichthys macropterus* in the dorsal origin nearer vent than gill openings. Reaches 266 mm.

Muraenichthys cookei new species (fig. 9).

Head 9 2/3; depth 3 4/5 in head; snout 6; eye 12; mouth cleft 3 1/3; interorbital 7.

Head and trunk 2 1/2 in total length. Snout broadly depressed, wide as long, end rounded. Eye posterior in mouth cleft, front edge at last third; diameter 2 1/5 in snout, 1 1/3 in interorbital. Lower jaw slightly shorter than upper, rictus scarcely extended beyond eye. Upper lateral teeth biserial; mandibular teeth uniserial, few biserial in front of jaw; vomerine teeth uniserial. Front nostril in short tube close behind snout tip; hind nostril in upper lip close before eye. Interorbital slightly convex. Gill opening equals eye. Skin smooth. Dorsal origin in advance of vent for space long as mouth cleft. Caudal narrow.

Back and upper surface prout's brown to tawny olive, below or on under surface much paler. Under a lens back seen to be dusted darker. Iris neutral slate. Fins pale. Length 197 mm.

Type No. 3421, Bishop Museum. Milaekahana, Oahu. June 11, 1926. Collection Neal and Cooke.

Only the type known. Very similar to *Muraenichthys gymnopterus* but differs in the mouth cleft not extended beyond the eye, the dentition and the dorsal but slightly advanced from the anal. From *Muraenichthys sibogae* Weber and Beaufort (Fishes Indo-Australian Archipelago, vol. 3, p. 276, 1916, type loc., Obi Major and Southern Timor), it also differs in similar fashion. In *Muraenichthys malabonensis* Herre (Philippine Jour. Sci., vol. 23, no. 2, p. 157, pl. 2, fig. 1, Aug. 1923, type loc., Malabon, Manila Bay, Philippine Islands), the dorsal begins midway between the gill opening and vent. Likewise *Muraenichthys thompsoni* Jordan and Richardson (U. S. Bur. Fish., Bull., vol. 27, p. 237, fig. 1, 1907 (1908), type loc., Manila Bay).

Muraenichthys schultzei Bleeker.

Muraenichthys schultzei Bleeker: Nat. Tijds. Ned. Ind., vol. 13, p. 366, 1857 (type loc., Karangbollong, South Java).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 245, 1911 (Funafuti, Ellice Island).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 5, 1925 (Johnston Island).

Head 7 1/8 to 8 3/4; depth 3 1/2 to 4 in head; snout 6 to 7 in head; eye 7 to 9; maxillary 2 2/5 to 2 2/3; interorbital 6 to 6 1/2.

Head and trunk 2 1/2 to 3 in combined total length. Eye placed behind middle in mouth-cleft, which reaches an eye diameter beyond eye. Dorsal origin little behind that of anal. No pectoral. Band of small teeth in each jaw and band down vomer.

Color in alcohol pale yellowish-brown. Upper half of trunk finely dotted with dusky to blackish. Along side of abdomen paler row of dusky dots. Upper surface of head dotted with dusky. Iris silvery. Length 73 to 100 mm. Characterized by the dorsal origin somewhat behind that of the anal. Reaches 130 mm.

In the Bishop Museum 12 from Johnston Island, obtained in July, 1923. Two in the National Museum from Funafuti. One in the Agassiz Museum from Funafuti.

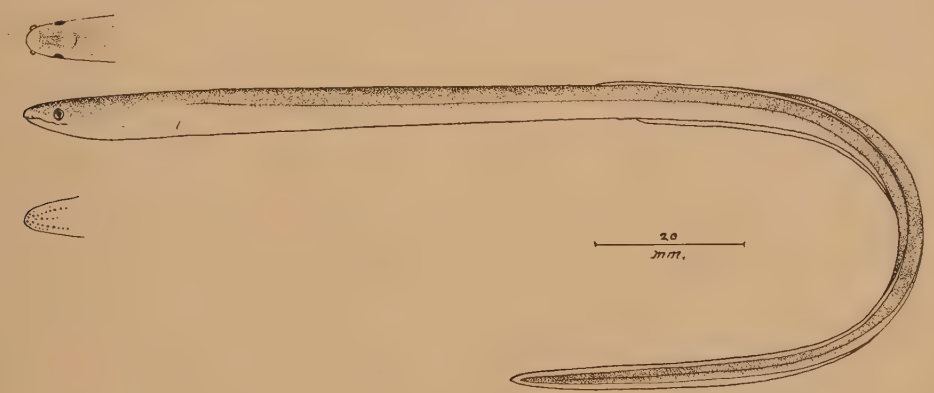

FIGURE 9.—Drawing of *Muraenichthys cookei*.

NEMICHTHYIDAE

Cyema atrum Günther.

Cyema atrum Günther: Ann. Mag. Nat. Hist., 5th ser., vol. 2, p. 251, 1878 (type loc., Pacific and Antarctic oceans, in 1500 to 1800 fathoms).

Mouth-cleft extends backwards to the end of the head. Vertical fins well developed, confined to and interrupted at end of tail, which without caudal fin. Black. Length 117 mm.

Nemichthys scolopaceus Richardson.

Nemichthys scolopaceus Richardson: Voyage "Samarang," Fishes, p. 25, pl. 10, figs. 1-3, 1848 (type loc., South Atlantic).—Peters: Akad. Wiss. Berlin, Monatsb., p. 849, 1876 (1877) (north of New Guinea).

Jaws equal. Lateral line with 3 series of pores. Dorsal origin before pectoral. Vent immediately behind pectorals. Length 1445 mm.

Bathypelagic.

Nematoprora polygonifera Gilbert.

Nematoprora polygonifera Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 587, fig. 234, 1903 (1905) (type loc., near Bird Island, in 313 to 800 fathoms).

Differs from *Nemichthys* in the absence of pores along the lateral line and the presence of pavement-like teeth not bearing backwardly-directed spinous tips Length 315 mm.

Serrivomer beanii Gill and Ryder.

Serrivomer beanii (Gill and Ryder) Gill: U. S. Nat. Mus., Proc., vol. 6, p. 255, 1883 (1884) (*nomen nudum*).—Gill and Ryder: op. cit., p. 260 (type loc., N. Lat. 41° 40′ 30″, W. Long. 65° 28′ 30″, in 855 fathoms).—Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 586, 1903 (1905) (off Oahu; Bird Island; Kauai; in 311 to 1067 fathoms).

Jaws unequal. Dorsal origin behind that of pectorals, also behind anal origin. Vent far distant from pectorals.

Stemonidium hypomelas Gilbert.

Stemonidium hypomelas Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 586, pl. 67, 1903 (1905) (type loc., near Niihau Island, in 537 to 672 fathoms).

Differs from *Serrivomer beanii* in that its dentition is like *Nemichthys*, teeth all reduced to small granular plates, arranged in quincunx and each ending in short acute tip directed posteriorly. Also dorsal begins little before anal. Length 171 mm.

OPHICHTHYIDAE

Myrichthys colubrinus (Boddaert) (fig. 10).

Muraena colubrina Boddaert: Neue Nordische Beytr., vol. 2, p. 56, pl. 2, fig. 3, 1781 (type loc., Amboyna).

Leiuranus colubrina Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Uvea).

Ophichthys colubrina Schmeltz: Mus. Godeffroy, Cat. 5, p. 37, 1874 (Viti Islands).—Ogilby: Australian Mus., Records, vol. 1, p. 7, 1890-91 (Howla Island, Shortland).—Waite: Australian Mus., Mem., no. 3, p. 195, pl. 8, fig. 3, 1897 (Funafuti, Ellice Islands).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 228, 1898 (Saypan, Marianes).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 514, 1901 (Samoa).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 40, 1910 (Society and Kingsmill Islands).

Ophichthys colubrinus Boulenger: Ann. Mag. Nat. Hist., 6th ser., vol. 20, p. 374, 1897 (Rotuma Island).

Chlevastes colubrina Jordan and Seale: (U.S.) Bur. Fish., Bull., vol. 25, p. 195, 1905 (1906) (Samoa).

Myrichthys (*Chlevastes*) *colubrinus* Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 285, figs. 130-131, 1916 (Humboldt Bay and Western New Guinea).

Myrichthys colubrinus Fowler: B. P. Bishop Mus., Bull. 22, p. 5, 1925 (Guam).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 5, 1925 (Johnston Island).

Chlevastes colubrinus Fowler and Silvester: Carnegie Inst., Marine Pap., p. 112, 1922 (Pago Pago).

Ophisurus alternans Quoy and Gaimard: Voyage "Uranie," Zool., p. 243, pl. 4, fig. 2, 1824 (type loc., Guam).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Viti Islands).

Ophisurus fasciatus Kner: Reise "Novara," Fische, vol. 1, pt. 5, p. 379, 1865 (Tahiti).—Bleeker: Akad. Amsterdam, Verslagen, ser. 2, vol. 2, p. 281, 1868 (Doreh, New Guinea).

Chlevastes fasciatus Jordan and Seale: (U.S.) Bur. Fish., Bull., vol. 25, p. 195, fig. 5, 1905 (1906) (Apia).—Fowler and Silvester: Carnegie Inst. Marine Papers, p. 112, 1922 (Pago Pago).

Ophichthys naja De Vis: Linn. Soc. New South Wales, Proc., vol. 8, p. 455, 1883 (type loc., South Sea Islands).

In the Bishop Museum 6 from Palmyra Island obtained by Thurston and Thaanum in May and June, 1922. The largest has 33 dark rings. Most with a number of dark rings not continuous on ventral surface of tail. In one 18 pale interspaces marked alternately with or without a dark round spot or occasionally 2 spots on 1 side of body. In none do the belly rings extend completely across. Also 12 from Johnston Island and 4 from Guam, obtained in 1923. In the National Museum 2 from Samoa. Also 2 without locality, likely Polynesia and another from Fiji, all 3 obtained by the Wilkes Expedition. In the Agassiz Museum 1 from Strong Island and 2 from Kusaie in the Carolines, 1 from the Pelew Islands, 6 from Apiang in the

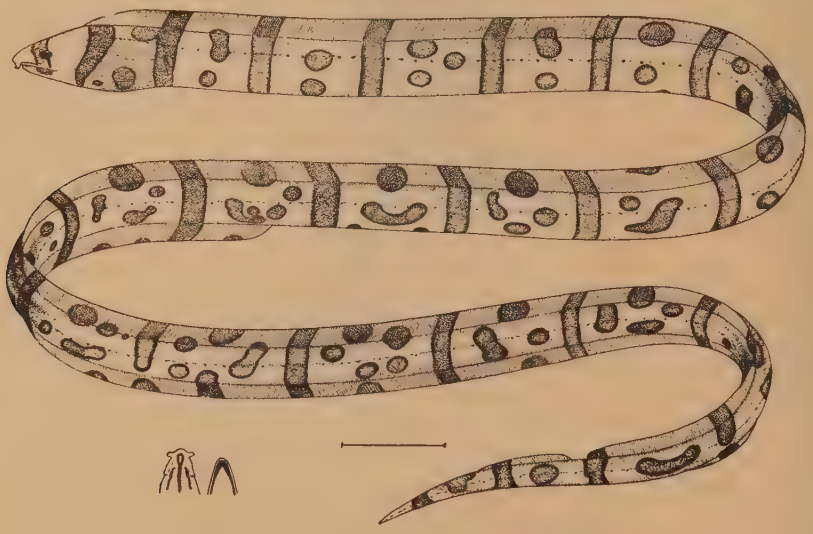

FIGURE 10.—Drawing of *Myrichthys colubrinus*.

Kingsmills, 7 from Ebon Island and 2 from Ascension Island in the Marshalls, 2 from the Society Islands, and 1 from Samoa.

Chlevastes elaps Fowler (Acad. Nat. Sci. Philadelphia, Proc., p. 13, fig. 3, 1912, Philippines) is not distinct though its dorsal shows more rays, 582 compared with 400 in the Oceania specimens examined.

Red Sea, East Indies, Japan, Tahiti.

Myrichthys maculosus (Cuvier).

Muraena maculosa Cuvier: Regne animal, vol. 2, p. 232, 1817 (on *Ophisurus ophis*, part, Lacépède, Hist. nat. Poiss., vol. 2, pp. 195, 196, pl. 6, fig. 2, 1800 (type loc., European Seas).

Ophichthys maculosus Günther: Rept. voyage "Challenger," vol. 1, p. 58, 1880 (Tongatabu).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 40, 1910 (Ponapé; Tongatabu; Tahiti; Hawaiian islands).

Myrichthys maculosus Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 284, 1916 (German New Guinea).—Fowler: B. P. Bishop Mus., Bull. 22, p. 5, 1925 (Guam).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 6, 1925 (Johnston Island).—Fowler: op. cit., Bull. 38, p. 5, 1927 (Washington and Howland islands).

Pisoodonophis magnifica Abbott: Acad. Nat. Sci. Philadelphia, Proc., p. 476, 1860 (type loc., Hawaiian islands).

Myrichthys magnificus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 494, pl. 18, fig. 3, 1900 (type).—Fowler: op. cit., p. 16, 1912 (type; remarks).

Ophichthys stypurus Smith and Swain: U. S. Nat. Mus., Proc., p. 120, 1882 (type loc., Johnston Island).

Myrichthys stypurus Jordan and Evermann: U. S Fish Comm., Bull., vol. 23, pt. 1, p. 84, fig. 19, 1903 (1905) (type).

Ophichthus colubrinus (non Boddaert) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no 3, p. 62, 1900 (1901) (large Guam specimen).

Head 14 1/4; depth 32 1/3; snout 5 1/8 in head; mouth-cleft 2 1/4; interorbital 5 1/3; eye 2 1/4 in snout; combined head and trunk 1 1/4 in rest of body; spots on head not evident; length 405 mm.

One from Fiji, obtained by the Wilkes Expedition, now in the National Museum. I have also examined the type of *Ophichthys stypurus* from Johnston Island, in the same institution. Three from Honolulu, of which largest 586 mm., and one from Guam, in the Bishop Museum. One from Johnston Island, obtained in July 1923, besides 2 from Guam. Two in the Academy, the types of *Pisoodonophis magnifica*, from Hawaii. One from Hawaii and 1 from Apiang in the Kingsmill Islands, both obtained by Andrew Garrett, in the Agassiz Museum.

Red Sea and Madagascar to the East Indies and Hawaii.

Callechelys marmoratus (Bleeker).

Dalophis marmorata Bleeker: Bataviaasch Genoot, Verh. (Muraenoid.), vol. 25, p. 37, 1853 (type loc., Siboga, Western Sumatra).

Ophichthys marmorata Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 404, 1910 (Tahiti; Pelew Islands; Hawaii).

Callechelys marmoratus Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 288, 1916 (Pelew Islands).

Callechelys guichenoti Kaup: Cat. apodal fish, p. 28, fig. 13, 1856 (type loc., Tahiti).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 18, pp. 206, 207, 1912 (type; Port Sandwich, New Hebrides).

Callechelys luteus Snyder: U. S. Fish Comm., Bull., vol. 22, p. 517, pl. 3, fig. 5, 1902 (1903) (type loc., Southern coast of Molokai).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 86, pl. 8, fig. 1, 1903 (1905) (type).

Head 18 1/4 to 21; depth 39 3/4 to 48; tail 2 1/2 to 2 3/5 in combined head and trunk; snout 6 to 8 in head; eye 14 to 14 1/2; mouth 3 1/2 to 4; interorbital 8 1/2 to 9; head width 4 2/3 to 5. Ground-color whitish, speckled and blotched with brownish to blackish. Spots smaller and little paler on ventral surface. Spots like back on dorsal. Anal largely whitish and unmarked. Length 480 to 590 mm.

Two in the Bishop Museum from the Honolulu markets in 1910. Type of *Callechelys luteus* from south coast of Molokai, March 31, 1902, in the National Museum.

Mauritius to the East Indies and Hawaii.

Callechelys melanotaenia Bleeker.

Callechelys melanotaenia Bleeker: Atlas ichth., vol. 4 p. 66, pl. (49) 193, fig. 2, 1864 (type loc., Amboyna).

Ophichthys melanotaenia Schmeltz: Mus. Godeffroy, Cat. 5, p. 37, 1874 (Apamana Island, Gilbert Group).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 403 1910 (Apamana).

Head 17; depth 37; tail 3 1/3 in rest of body; snout 7 in head; mouth 3 1/4 from snout tip; interorbital 8 1/5; head width 3 1/4; eye 2 1/5.

Snout conic, long as wide. Teeth uniserial, with lower exposed surface of snout with triangle of 3 partly depressible canines; jaw teeth otherwise uniserial, slender, conic. Tip of closed mandible opposite front edge of eye. Anterior nostril short tube midway in preoral length and hind one deep pit in fleshy lip opposite front edge of eye. Dorsal origin opposite rictal angle. Whitish generally. Head with transverse brown band over last half of snout, another close behind eye and more indistinctly defined one at occiput over predorsal. All over head numerous, close-set, little shallow pits, producing somewhat honey-combed appearance. Pits on head with dusky edges, 3 along each mandibular ramus, 2 behind each rictus, 3 along each upper lip, 2 postocular, 1 frontal and 2 supraocular. Broad black band from each side of head along upper part of side. Dorsal edged narrowly, but distinctly, blackish. Length 587 mm.

One in the Bishop Museum, obtained at Palmyra Island in May-June, 1922, by Thurston and Thaanum.

This species rare, and has been previously and for the first time noticed in Oceania. C. M. Cooke, Jr., reports also seeing one at Palmyra Island in 1913.

Red Sea, Mauritius, East Indies, Riu Kiu Islands, Gilbert Islands.

Callechelys filaria (Günther).

Ophichthys filaria Günther: Ann. Mag. Nat. Hist., 4th ser., vol. 10, p. 425, 1872 (type loc., Misol Island).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 404, 1910 (type; Samoa).

Callechelys filaria Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 290, 1916 (type; Samoa).

One in the Agassiz Museum from Viti, Fiji, length 540 mm. It shows the following:

Body very long, depth 3 3/4 in head. Combined head and trunk little longer than tail. Eye small, diameter

half of snout, about midway between snout tip and rictus. Front nostril in small tube; hind nostril in upper lip below front eye edge. Pectoral minute, long as eye. Maxillary teeth biserial, on premaxillary 2. Uniform brownish above, paler below.

Leiuranus semicinctus (Lay and Bennett).

Ophisurus semicinctus Lay and Bennett: Voyage "Beechey," Zool., p. 66, pl. 20, fig. 4, 1839 (type loc., Oahu?).

Liuranus semicinctus Günther: Cat. fishes Brit. Mus., vol. 8, p. 50, 1870 (Fiji).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 37, 1874 (South Sea).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1422, 1906 (Upolu).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 39, 1910 (Samoa; Fiji; Tahiti).

Leiuranus semicinctus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 494, 1900 (Hawaiian islands).—Snyder: U. S. Fish Comm., Bull., vol. 22, p. 516, 1902 (1904) (Honolulu).—Jordan and Seale: (U.S.) Bur. Fish., Bull., vol. 25, p. 194, 1905 (1906) (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 246, 1911 (Arno Atoll, Marshall Islands).—Fowler: op. cit., p. 13, 1912 (Hawaiian islands).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 99, 1913 (Saonek).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 294, fig. 137, 1916 (Saonek near Waigiu).—Fowler: Copeia, no. 112, p. 82, Nov. 20, 1922 (Hawaiian islands).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 6, 1925 (Johnston Island).

Ophichthys cobra De Vis: Linn. Soc. New South Wales, Proc., vol. 8, p. 455, 1883 (type loc., South Seas).

Ophichthus colubrinus (non Boddaert) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 62, 1900 (1901) (Guam).

Ophichthys colubrinus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 21, 1902 (Honolulu).

Head 13 1/3 to 15; depth 50 to 58; snout 5 to 6 1/2 in head; eye 10 1/2 to 15; mouth-cleft 3 1/4 to 3 3/5; interorbital 9 to 10; pectoral 6 1/4 to 10.

Body mostly cylindrical, tail but slightly compressed behind, tapers gradually most its length, then sharply at tip which ends in horny conic point. Long head with rather swollen pharynx, width 3 2/3 to 4 1/4 in its length. Snout depressed, rather short, flattened, shark-like in appearance, edges all thin, basal width 7/8 its length. Small eye at first fifth in head, close to upper profile. Rather small mouth wide, gape reaches opposite hind eye edge. Teeth minute, uniserial, pointed, hooked backward, upper much closer and mandibular not continued across symphysis. Several rather large conic premaxillary teeth protrude well before closed mandible tip, also sharp-pointed and directed little backward. Small fleshy tongue adnate. Mandible broad, shallow. Lips fleshy. Front nostril in short fleshy tube on snout tip below, opens down, well before closed mandible tip. Hind nostril in lips, opens downward and placed below front eye edge. Interorbital well depressed, cranium convex above.

Gill opening nearly vertical, length about half of snout. Head with 3 wide-set pairs of pores above, first pair close behind front tubular nostrils, second just before eyes and third on hind interorbital opposite hind pupil edges. Pore on upper lip between front and hind nostrils, followed by 2 behind latter below eye and 3 more in vertical series behind eye. Each mandibular ramus with 3 pores, 2 more little posterior on lower side of head, 1 on top of head about opposite pores just behind eyes and 3 transversely at occiput at beginning of lateral line. Dorsal origin about over middle of pectoral, fin not continued around end of tail. Pectoral small, short.

Generally pale yellowish-brown with 24 to 27 deep brown broad cross blotches, these saddle-like on trunk and become entirely continuous below on tail posteriorly. Tips of snout and tail whitish. First dark transverse blotch just before eye, second just behind and much narrower than others. Entire under surface of head pale. Iris slaty. Length 318 to 337 mm.

Described largely from 2 Hawaiian specimens in the Academy. One in the Bishop Museum, 152 mm. from Guam and another from Honolulu 456 mm. Also 3 from Johnston Island obtained in 1923. In the National Museum one from Samoa and one from Arno Atoll, Marshall Islands. In the Agassiz Museum 1 from Hawaii, 1 from Apiang in the Kingsmill Islands, and one from Ebon Island, Marshall Islands.

East Indies, China, Japan, Queensland, Hawaii.

Pisoodonophis hypselopterus (Bleeker).

Ophisurus hypselopterus Bleeker: Nat. Tijds. Ned. Ind., vol. 2, p. 69, 1851 (type loc., Bandjermassing, Borneo).

Ophichthys hypselopterus Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 400, 1910 (Ponapé).

Dorsal origin behind end of pectoral in this and the next species. Dorsal and anal very elevated, height of latter equals that of body. Combined head and trunk nearly twice in tail. Length over 750 mm.

East Indies to Ponapé.

Pisoodonophis boro (Buchanan-Hamilton).

Ophisurus boro Buchanan-Hamilton: Fishes of Ganges, pp. 20, 363, 1822 (type loc., Ganges estuaries near Calcutta).

Pisodonophis boro Bleeker: Akad. Amsterdam, Verslagen, 2nd. ser., vol. 2, p. 281, 1868 (Doreh, New Guinea).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 297, fig. 138, 1916 (Doreh).

Differs from *P. hypselopterus* (Bleeker) in the very low dorsal and anal and the combined head and trunk 1 1/2 times or less in tail. Length 930 mm.

India, East Indies, China.

Pisoodonophis cancrivorus (Richardson).

Ophisurus cancivorus Richardson: Voyage "Erebus" and "Terror", Ichth., p. 97, pl. 50, figs. 6-9, 1844-48 (type loc., Port Essington).

Ophichthys cancrivorus Schmeltz: Mus. Godeffroy, Cat. 5, p. 37, 1874 (Viti Levu).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 400, 1910 (Apia, Samoa).

Pisoodonophis shapii Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Namusi).

Differs from both *P. hyselopterus* and *P. boro* in the dorsal origin over the middle of the pectoral. Combined head and trunk 1 1/2 times in tail. Length 760 mm.

Madagascar, Arabia, East Indies, Japan, Samoa.

Ophichthus pinguis Günther.

Ophichthys pinguis Günther: Ann. Mag. Nat. Hist. London, 4th ser., vol. 10, p. 425, 1872 (type loc., Solomon Islands).—Günther: Cruise of "Curacoa," p. (410) 430, pl. 35, 1873 (type).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 399, 1910 (type).

This species and *O. calamus* Günther with the dorsal origin clearly before that of the pectoral and the teeth uniserial. Head 5 1/2 in trunk, which little over 1 1/2 in tail. Pectoral 3 in head. Trunk with 8 broad blackish crossbands, 15 on tail; head with small round blackish spots. Length 408 mm.

Australia, Lord Howe Island, Solomon Islands.

Ophichthus calamus Günther.

Ophichthys calamus Günther: Cat. fishes Brit. Mus., vol. 8, p. 70, 1870 (type loc., Freemantle, Australia).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 6, 1925 (Lahaina, Maui).

Microdonophis macgregori Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 422, fig. 2, 1902 (1903) (type loc., Lahaina, Maui).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 82, fig. 18, 1903 (1905) (type).

Head 12 2/3; depth 3 in head; combined head and trunk 2 5/6 in tail; snout 5 in head; mouth 2 1/4; eye 1 1/2 in snout; interorbital 1 3/5.

Body subcylindrical, slender, tail tapering but slightly posteriorly. Head compressed, width 5 in its length. Snout conic, width 1 1/3 in its length. Eye with front edge midway in mouth length, without eyelids. Mouth horizontal, upper jaw well protruded. Upper lip with fringe of short fleshy barbels. Teeth conic, uniserial in jaws and on vomer. Front nostril in short fleshy tube each side of snout tip; hind nostril pore in upper lip below front eye edge. Interorbital convex. Gill opening 1 1/2 in snout. Skin smooth. Lateral line median laterally. Dorsal origin midway between hind eye edge and gill opening. Dorsal and anal low. Pectoral 3 1/2 in head. Tip of tail little compressed, ends in horny point.

Brownish above, finely dotted or specked with darker. Lower surface pale to whitish and uniform. Fins pale, uniform. Iris pale slaty. Length 130 mm.

One in the Bishop Museum, obtained at Lahaina, Maui, in June, 1923.

Distributed from East Australia to Hawaii. Reaches 531 mm.

Ophichthus cephalozona Bleeker.

Ophichthys cephalozona Bleeker: Atlas ichth., vol. 4, p. 49, pl. 12 (156), fig. 2, 1864 (type loc., Singapore and Amboyna).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Ovalau).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 398, 1910 (Pelew Islands, Ovalau, Tongatabu).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 303, fig. 143, 1916 (western New Guinea).

One in the Agassiz Museum from the Pelew Islands. In the National Museum 2 specimens obtained by the Wilkes Expedition, which without locality though likely from Oceania.

Ophichthus polyophthalmus Bleeker.

Ophichthys polyophthalmus Bleeker: Nederlandsch Tijds. Dierk., vol. 2, p. 43, 1865 (type loc., Amboyna).

Ophichthus polyophthalmus Fowler: B. P. Bishop Mus., Bull. 38, p. 5, 1927 (Kunhei, Kahoolawe Island).

Microdonophis polyophthalmus Jordan and Snyder: (U.S.) Bur. Fish., Bull., vol. 26, p. 207, 1906 (1907) (Honolulu).

Microdonophis fowleri Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 164, 1902 (1903) (type loc., Honolulu).—Jordan and Snyder: U. S. Nat. Mus., Proc., 27, p. 940, 1904 (Hawaiian islands).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 82, pl. 6, 1903 (1905) (type; Honolulu).—Jordan and Snyder: U. S. Bur. Fish., Bull., vol. 26, p. 208, 1906 (1907) (Honolulu).

Ophichthys garretti Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 397, pl. 163, fig. A, 1910 (type loc., Society Islands).

A specimen obtained by the Wilkes Expedition, without locality though doubtless from somewhere in Oceania, now in the National Museum. In the same institution also the type of *Microdonophis fowleri* and 2 other specimens from Honolulu. In the Bishop Museum 11 specimens from the Honolulu markets, largest 1039 mm. Great variation in color is noticed in this series, due in large measure to conditions of preparation and preservation. In some the dark vertical bands number 19. In others the dark vertical bands have largely if not entirely disappeared so that the dark spots or rings on the back and dorsal fin are all that remain. In the largest specimen the pale reticulations are most distinct on the head and broken up into a closely spotted or blotched pattern.

Quite likely the nominal *Ophichthys garretti* is really another synonym. The coloration is exactly like certain specimens examined in the Bishop Museum and is doubtless similarly the result of preservation.

East Indies, Riu Kiu, Hawaii.

Ophichthus triserialis (Kaup).

Muraenopsis triserialis Kaup: Cat. apodal fish, p. 12, 1856 (type loc., Pacific Ocean, voyage of the "Herald").

Ophichthus triserialis Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 17, 1912 (type of *Herpetoichthys callisoma*).—Fowler: Copeia, no. 112, p. 82, Nov. 20, 1922 (same type).

Herpetoichthys callisoma Abbott: Acad. Nat. Sci. Philadelphia, Proc., p. 475, 1860 (type loc., Pacific Ocean).

Head 10; depth at vent 32 2/3; D. about 255; A. 87; P. 15; head width 3 2/5 its length; head depth 2 1/2; snout 5 7/8; eye 9; mouth 2 3/4; interorbital 8; mandible 2 1/6; pectoral 4 1/5; pores in lateral line 148, first 10 before gill opening.

Body but moderately compressed, rather slender, with gradually tapering tail. Head moderately compressed. Snout conic, little depressed, long as wide. Eye supero-lateral, little before first fourth in head. Mouth moderate, rather narrow. Lips thick, entire, fleshy, firm. Teeth conic, sharp-pointed, directed backward. Premaxillaries with 3 exposed teeth before lower jaw tip. Supero-lateral teeth first uniserial, biserial behind front of eye, mostly little larger in outer row, at least below eye and well separated from inner row. Mandibular teeth not continued across symphysis, outer series enlarged and recurved. Vomerine teeth uniserial, not continuous with supero-lateral or premaxillary series and anterior ones largest. Tongue small, fleshy, not free, smooth. Narrow mandible small, snout tip well protruded in front. Front nostril in tube in upper lip near first third in snout length or opposite closed mandible tip. Hind nostril large, opens down in upper lip just before and below eye, with cutaneous valve in front. Interorbital broadly convex.

Gill opening begins nearly opposite pectoral origin, about equals interorbital. Each mandibular ramus with 7 pores; one each side of snout tip on upper lip as one after front nasal tube and 3 more behind hind nostril; pair of well separated pores on snout above just behind nasal tubes, another pair just before eyes and still another interorbital pair, opposite last third in eyes. Dorsal origin slightly before tips of depressed pectoral, or distant from gill opening trifle over fourth of head length, fin quite high, with well developed rays and extends almost to tail tip. Anal like dorsal, little lower. Tail ends in rather firm, tough conic tip. Pectoral small,

supero-median rays longest, fin broadly expanded. Vent close before anal.

Largely dull brownish above, fading almost white below. About 27 pairs of deep blackish-brown blotches on median dorsal line, first over gill-opening. Alternating along course of lateral line about as many still larger similar-colored blotches. Occasionally a few irregularities and several smaller accessory scattered dark spots. Dorsal blotches reflected on dorsal fin, which pale or ochraceous-white. Alternating more or less dusky blotches between reflected dorsal saddles, in size mostly equal to latter and becoming more blackish on fin edges. Head above finely spotted with dark brownish, though on sides of pharynx also more or less nebulous dusky or smutty areas. Spots and these markings continuous on head below. Pectoral pale brownish, deep brown blotch basally and fin also slightly darker distally. Eye pale or whitish. Length 1008 mm.

Described here from the type of *Herpetoichthys callisoma* Abbott, labeled Pacific Ocean, from W. G. Burke, in the Academy.

Brachysomophis crocodilinus (Bennett).

Ophisurus crocodilinus Bennett: Comm. Zool. Soc. London, Proc., p. 32, 1833 (type loc., Mauritius).

Brachisomophis crocodilinus Vaillant: Soc. Philom. Paris, Bull., 7th ser., vol. 11, p. 52, 1886-87 (Tahiti).

Brachysomophis (Brachysomophis) crocodilinus Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 314, fig. 148 head, 1916 (copied).

Ophichthys crocodilinus Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 398, 1916 (Savaii; Tahiti).

Brachysomophis horridus Kaup: Cat. apodal fish, p. 9, fig. 6, 1856 (no type locality and Tahiti).

Snout long as, or longer than eye, which 15 in head. Pectoral 10 or 11 in head. Brownish above, paler below; series of black pores along lateral line; occiput with transverse series of yellowish spots. Length 1375 mm.

Widely distributed from Arabia, Mauritius to Japan, Savai, Tahiti, and the Galapagos Islands.

Brachysomophis henshawi Jordan and Snyder.

Brachysomophis henshawi Jordan and Snyder: U. S. Nat. Mus., Proc., 27, p. 940, 1904 (type loc., Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol 23, pt. 1, p. 83, pl. 7, 1903 (1905) (type).

Ophichthys henshawi Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 398, 1910 (Tahiti; Society Islands).

According to Günther, differing from *B. crocodilinus* in the longer snout, which 1/10 length of head. Pectoral 8 in head. Length 608 mm.

Type from Honolulu, obtained by Berndt, now in the National Museum.

Brachysomophis kampeni (Weber and Beaufort).

Brachysomophis (Achirophichthys) kampeni Weber and Beaufort: Fishes Indo-Australia Archipelago, vol. 3, p. 316, figs. 150-151, 1916 (type loc., Humboldt Bay near mouth of Mbai River, New Guinea).

Differs from both *B. henshawi* and *B. kampeni* in the absence of pectorals and the lips not fringed, or only with a single row of minute tubercular papillae. Vent behind middle in length. Length 323 mm.

Only the type known.

Caecula longipinne (Kner and Steindachner).

Sphagebranchus longipinnis Kner and Steindachner: Akad. Wiss. Wien, Sitz., vol. 54, pt. 1, p. 390, fig. 14, 1867 (type loc., Samoa Islands).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Upolu).

Dalophis longipinnis Jordan and Seale: (U.S.) Bur. Fish., Bull., vol. 25, p. 194, 1905 (1906) (Apia).

Ophichthys longipinnis Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 404, 1910 (Samoa).

Dorsal and anal well developed, origin of dorsal little nearer snout tip than gill opening. Brown above, paler below. Length 464 mm.

One from Apia in the National Museum.

Caecula catostomus (Schneider).

Sphagebranchus catostomus Schneider: Systema ichth., Bloch, p. 536, 1801 (type loc., Tahiti).

Muraena coeca (non Linné) (Forster) Lichtenstein: Descriptiones animalium, p. 230, 1844 (Tahiti).

Body smooth, slender. Head slender, acute. Rostrum conic, acute. Eye small, little conspicuous, above middle of mouth. Cirrhi 4. Nostrils small Gill opening small. Head with pores. Brown above, white below. Dorsal and anal white.

An imperfectly described species, not recognized since. Possibly it may be *Caecula longipinne* (Kner and Steindachner).

Caecula polyophthalma (Bleeker).

Dalophis polyophthalmus Bleeker: Nat. Tijds. Ned. Ind., vol. 4, p. 299, 1853 (type loc., Priaman, Sumatra).

Sphagebranchus polyophthalmus Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 320, 1916 (copied).

Ophichthys punctulatus Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 403, 1910 (Samoa; Tahiti; Viti Levu).

Vertical fins low; space from dorsal origin to gill openings 2 1/3 to 4 in head. Brownish above, yellowish below; upper surface of head and neck with double row of yellow round spots; transverse yellow nuchal streak; each pore of lateral line in yellow spot; length over 325 mm.

Possibly *Apterichte* of Jouan (Soc. Cherbourg, Mem., vol. 9, p. 105, 1863, Kanala, New Caledonia) is this species:

Body eel-like, nearly cylindrical; tail pointed, without fin. Head somewhat swollen below; snout long; no eyes; upper jaw longer. Longitudinal groove replaces dorsal and anal, and 2 similar ones along side. Rudiment of pectoral somewhat before and below gill opening. Body brown, with yellowish rings. Length 360 mm.

East Indies to Samoa and Tahiti.

Caecula orientale (McClelland).

Dalophis orientalis McClelland: Calcutta Jour. Nat. Hist., vol. 5, p. 213, 1845 (type loc., Coromandel Coast). (On *Manti bukaro paumu* Russell, Fishes of Coromandel, vol. 1, p. 26, pl. 37, 1803, Vizagapatam).

Sphagebranchus orientalis Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 321, 1916 (British New Guinea).

Differs from *C. polyophthalma* (Bleeker) in more advanced dorsal origin, its distance from gill openings 7 in head. Brownish above, yellowish below. Length over 300 mm.

Madagascar, India, New Guinea.

Caecula mindora Jordan and Richardson.

Coecula mindora Jordan and Richardson: (U.S.) Bur. Fish., Bull., vol. 27, p. 239, 1907 (1908) (type loc., Mindoro Island, Philippines).

Sphagebranchus mindoro Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 99, 1913 (Rio Waiho in fresh water, Waigiu)—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 322, 1916 (copied).

Space between dorsal origin and gill opening 4 to 4 3/5 in head, which 2 3/5 to 2 4/5 in trunk. Eye above first third in mouth-cleft. Length nearly 400 mm.

East Indies.

Caecula macrodon (Bleeker).

Sphagebranchus macrodon Bleeker: Nederlandsch Tijds. Dierk., pt. 1, p. 184, 1863 (type loc., Borneo).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 323, 1916 (copied).

Ophichthys macrodon Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 402, 1910 (Viti Levu; Society Islands).

Differs from *C. mindora* in the head 3 to 3 1/2 in trunk and eye above middle in mouth-cleft. Dark olivaceous above, paler below. Length 500 mm.

East Indies to Society Islands.

Caecula bicolor (Kaup).

Lamnostoma bicolor Kaup: Cat. apodal fish, p. 24, 1856 (type loc., Borneo).

Sphagebranchus bicolor Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Namusi).

Ophichthys bicolor Schmeltz: Mus. Godeffroy, Cat. 5, p. 37, 1874 (Viti Islands).

This and *C. lumbricoides* with all teeth equally small, whereas in *C. macrodon* and *C. mindora* the vomerine are stouter than the others. Head 4 2/3 in trunk; mouth cleft 3 1/2 in head; teeth uniserial. Brown above, paler below. Length 425 mm.

Borneo, Fiji.

Caecula lumbricoides (Bleeker).

Sphagebranchus lumbricoides Bleeker: Ned. Tijds. Dierk., pt. 2, p. 46, 1865 (type loc., Timor).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Namusi).

Differs from *C. bicolor* in the head 6 in trunk, vomerine teeth biserial and mouth-cleft 3 in head. Length 230 mm.

Ceylon, Timor, Fiji.

Caecula gjellerupi (Weber and Beaufort).

Sphagebranchus gjellerupi Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 326, 1916 (type loc., Tänah Merah in a brook near shore, Dutch North New Guinea).

Dorsal origin over half of head length behind gill openings. Head 4 1/10 in trunk. Teeth uniserial. Yellowish brown, dusted darker. Length 152 mm.

Caecula flavicauda (Snyder).

Sphagebranchus flavicaudus Snyder: U. S. Fish. Comm., Bull., vol. 22, p. 516, pl. 2, fig. 4, 1902 (1904) (type loc., between Maui and Lanai in 21 to 28 fathoms off northeast Hawaii in 50 to 60 fathoms).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 80, pl. 5, fig. 2, 1903 (1905) (type).—Gilbert: op. cit., vol. 23, pt. 2, p. 588, 1903 (1905) (off Hawaii; between Maui and Lanai, in 23 to 66 fathoms).

Head 4 to vent, 9 to base of caudal fin; least depth of body about 4 in head; combined head and trunk 1 1/4 in tail; snout 2 1/4 in mouth gape; eye half of snout; jaw teeth and vomerine teeth uniserial, uniform, also few on premaxillary enlarged. Fins not developed; end of tail constricted to form slender point. Uniform pale brown. Only pupil of eye black. One in poor condition, 244 mm.

The above in the Bishop Museum, obtained by C. M. Cooke, III, on April 8, 1919, at Kahala, Oahu. I have also seen the type of *Sphagebranchus flavicaudus* in the National Museum, obtained April 12, 1902 between Maui and Lanai.

Possibly *Sphagebranchus klazingai* Weber (Siboga Exped., vol. 65, p. 47, 1913, type loc., Banda) may be the same as *C. flavicauda*.

MORINGUIDAE

Aphthalmichthys bicolor (Kaup).

Moringua bicolor Kaup: Cat. apodal fish, p. 107, 1856 (type loc., Timor).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 405, 1910 (Kandavu; New Pomerania).

Dorsal and anal with visible rays at least anteriorly and posteriorly. Space between anal and vent more than head. Length 775 mm.

East Indies to Kandavu and New Britain.

Aphthalmichthys microchir (Bleeker).

Moringua microchir Bleeker: Nat. Tijds. Ned. Ind., vol. 4, p. 124, 1853 (type loc., Amboyna; Cauer, Western Sumatra).—Schmeltz; Mus. Godeffroy, Cat. 4, p. 26, 1869 (Ovalau).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 405, 1910 (Marquesas Islands; Ovalau).

Moringua lumbricoides Schmeltz: Mus. Godeffroy, Cat. 5, p. 38, 1874 (Ovalau).

Differs from *A. bicolor* (Kaup) in space between vent and anal fin but 1/3 in head. Length 240 mm.

East Indies to the Marquesas Islands and Ovalau.

Aphthalmichthys macrocephalus Bleeker.

Aphthalmichthys macrocephalus Bleeker: Nederlandsch Tijds. Dierk., vol. 1, p. 165, 1863 (type loc., Timor).

Moringua macrocephala Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 44, 1885 (Rubi, New Guinea).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 195, 1905 (1906) (Pago Pago).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 407, 1910 (Kanathea; Vitu).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 341, 1916 (New Guinea).

Moringua (Aphthalmichthys) macrocephelus Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1422, 1906 (Upolu).

This species, *A. abbrevialus*, and *A. javanicus* have the dorsal reduced to a low fold, with a few feeble rays at the extreme tip of the tail only. Head 8 2/3 to 9 1/10; depth 34 to 40. Length 700 mm.

One from Samoa in the National Museum.

India, East Indies, Fiji, Samoa.

Aphthalmichthys abbreviatus Bleeker.

Aphthalmichthys abbreviatus Bleeker: Nederlandsch Tijds. Dierk., vol. 1, p. 163, 1863 (type loc., Prigi, Java; Batu; Manado, Celebes; Ternate; Amboyna).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Namusi).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 99, 1913 (Saonek).—Fowler: B. P. Bishop Mus., Bull. 38, p. 6, 1927 (Tahiti).

Moringua abbreviata Schmeltz, Mus. Godeffroy, Cat. 5, p. 38, 1874 (Viti Levu).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 406, 1910 (Fiji).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 341, 1916 (Saonek Island near Waigiu, Humboldt Bay, Dutch New Guinea).

Moringua socialis Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 406, pl. 169, fig. A, 1910 (type loc., Tahiti?).

Head 10 1/2 (when young) to 13 1/3; depth 40 to 58. Length 392 mm.

East Indies, Riu Kiu, Fiji, Tahiti.

Aphthalmichthys javanicus Kaup.

Aphthalmichthys javanicus Kaup: Cat. apodal fish, p. 105, fig. 71, 1856 (type loc., Java).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 99, 1913 (Saonek).

Moringua javanica Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 12, 1906 (Nukuhiva, Marquesas Islands).—Günther: Mus. Godeffroy, Jour., vol. 9, pt.

17, p. 405, 1910 (Samoa; Fiji; Friendly Islands; Paumotus; Rarotonga).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 342, 1916 (Saonek Island, Waigiu; Humboldt Bay, Dutch New Guinea).—Fowler: B. P. Bishop Mus., Bull. 22, p. 4, 1925 (Guam).

Moringua hawaiiensis Snyder: U. S. Fish Comm., Bull., vol. 22, p. 517, pl. 3, fig. 6, 1902 (1904) (type loc., Honolulu).

Head 12 to 14; depth about 58 to 60, or 4 1/4 to 4 1/2 in head; snout 6 1/2 to 8 in head measured from upper jaw tip; mouth-cleft 3 1/4 to 5 1/2; eye 2 1/2 to 5 in snout; interorbital 1 1/2.

Body and tail subcylindrical, mostly uniformly deep, tail tapering rather abruptly to sharp point; tail 2 2/5 to 2 1/2 in combined head and body. Head attenuated, width 5 1/2 to 6 in its total length. Snout conic, width 1 1/8 to 1 1/6 in its length. Eye very small, its center about last 2/5 in mouth-cleft. Mouth moderate, lower jaw protruding. Teeth conic, recurved, uniserial, anterior little larger; single row of smaller ones on vomer. Front nostril in short tube near front of snout; hind nostril in short tube below and close before eye. Interorbital convex. Gill opening little less than snout. Skin smooth. Dorsal origin about head length behind vent, fin low and connected with short pointed caudal. Anal similar, begins close behind vent or well posterior, though equally well before dorsal; anal origin usually slightly over space equal to 2/3 of head behind vent. Caudal slightly less than combined snout and eye.

Dull sepia above, becoming pale isabella color below. Muzzle pale. Iris slaty. Length 166 to 371 mm.

The largest specimen obtained in Honolulu in 1903, besides 3 from Guam in 1923, in the Bishop Museum. The type of *Moringua hawaiiensis* Snyder in the National Museum.

East Indies to Japan, Hawaii, Tuamotus, and Friendly Islands.

ECHIDNIDAE (Muraenidae auct.)

Echidna zebra (Shaw) (Pl. I, *E*).

Gymnothorax zebra Shaw: Naturalist's miscellany, vol. 9, pl. 322, 1797 (type loc., American seas [error]).

Echidna zebra Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Viti Islands).—Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 301, 1868 (Waigiu).—Snyder: U. S. Fish Comm., Bull., vol. 22, p. 520, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 106, pl. 20, 1903 (1905) (Honolulu, Kailua, Samoa).—Steindachner: Akad. Wiss. Wien., Sitz., vol. 115, pt. 1, p. 1422, 1906 (Upolu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 203, 1905 (1906) (Samoa).

Muraena zebra Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 422, 1910 (Samoa, Society Islands, Kingsmills, New Lauenburg, Duke of York Island).

Gymnomuraena doliata Lacépède: Hist. nat. Poiss., vol. 5, pp. 648, 649, pl. 19, fig. 4, 1801 (type loc., New Britain).

Head 9 1/3 to 11 2/5; depth 16 1/4 to 17; snout 6 to 6 1/5 in head; mouth 2 1/3 to 2 3/5; interorbital 4 2/3 to 5. Tail slightly less than combined head and trunk in adult, slightly more in young. Head width 1 3/4 in its length. Eye 2 1/2 in snout. Gill opening 2 2/3 to 2 4/5 in head. Vertical white rings 55 to 83, quite variable, in some half-grown specimens white rings often broken as dots, bars or lines, in others only partially developed.

In the Bishop Museum 6 from Honolulu, 342 to 1102 mm. The National Museum has 1 obtained by the Wilkes Expedition at Samoa. Other material 3 Samoan and 1 Hawaiian, all adult. In the Agassiz Museum 1 from the Society Islands, 4 from Ebon Island, 1 from Apiang, and 1 from Honolulu.

Gymnomuraena fasciata Kaup, said to be the type of *Muraena molendinaris* Bennett, simply renamed, and be 1270 mm. long, had 100 to 114 cross lines. It was obtained at Mauritius. Jouan evidently notices this species as *Apterichte* (Soc. Cherbourg, Mem., vol. 9, p. 105, 1863) from reefs north of New Caledonia. His specimen, 360 mm. long, is described with the tail pointed without fins, in alcohol the body brown with yellow rings.

Widely distributed from East Africa to the East Indies, Philippines, Hawaii, and Society Islands.

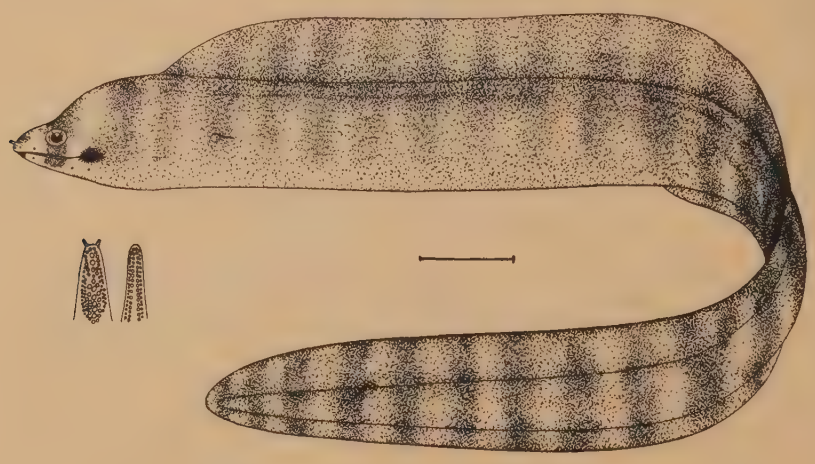

FIGURE 11.—Drawing of *Echidna polyzona*.

Echidna polyzona (Richardson) (fig. 11).

Muraena polyzona Richardson: Voyage "Sulphur," Fishes, p. 112, pl. 55, figs. 11 to 14, 1844 (no type locality).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 422, 1910 (Marquesas Islands; Samoa; Tahiti;

Wallis Island; New Lauenburg on Duke of York Island).

Poecilophis polyzona Kner: Reise "Novara," Fishe, vol. 1, pt. 5, p. 382, 1865 (Tahiti).

Echidna polyzona Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Samoa).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 496, 1900 (Honolulu).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1423, 1906 (Upolu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 12, 1906 (Nukuhiva, Marquesas Islands).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 30, 1912 (Hawaiian islands).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 346, fig. 169, 1916 (Waigiu).—Fowler: Copeia, no. 112, p. 82, Nov. 20, 1922 (Hawaii).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 6, 1925 (French Frigates Shoal).—Fowler: op. cit., Bull. 38, p. 6, 1927 (Christmas Island).

Leihala polyzona Whitley: Australian Mus., Records, vol. 16, no. 1, p. 8, 1927 (Bougainville, Solomon Islands; Haapia, Friendly Islands; Duke of York Island and Malakula, New Hebrides).

Echidna tritor Vaillant and Sauvage: Rev. Mag. Zool., 3rd ser., vol. 3, p. 287, 1875 (type loc., Hawaiian islands).—Jordan and Snyder: (U. S.) Bur. Fish., Bull., vol. 26, p. 208, 1906 (1907) (Honolulu).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 248, 1911 (Fakarava, Paumotus).

Leihala tritor E. K. Jordan: U. S. Nat. Mus., Proc., vol. 66, p. 5, pl. 1, figs. 1-2, 1925 (Honolulu).

Echidna zonata Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 495, pl. 18, fig. 2, 1900 (type loc., Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 108, fig. 31, 1903 (1905) (types of *Echidna vincta* Jenkins).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 30, 1912 (type).

Echidna leihala Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 428, fig. 9, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 109, fig. 32, 1903 (1905) (types).

Echidna vincta Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 429, fig. 10, 1902 (1903) (type loc., Honolulu).—Snyder: op. cit., p. 521, 1902 (1904) (Honolulu).

Echidna obscura Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 430, fig. 11, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 107, fig. 30, 1903 (1905) (types).

Echidna psalion Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 431, fig. 12, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 106, fig. 29, 1903 (1905) (type).

Muraena nebulosa (non Bloch) Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 127, 1903 (Marcus Island).

Echidna zonophaea Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 167, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 109, pl. 21, 1903 (1905) (types).

Echidna sauvagei Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 30, fig. 8, 1912 (no type locality [probably Hawaii]).

Head 6 1/2 to 8 5/6; depth 13 (adult) to 21; head width 3 1/8 to 4 in its length; head depth 1 7/8 to 2 1/8; snout 4 4/5 to 7; eye 7 1/3 to 11 3/4; mouth 2 3/4 to 3 1/4; interorbital 6 1/3 to 8 1/2; head 3 2/5 to 4 3/5 to vent.

Body well compressed, tail tapering suddenly behind near end. Head compressed, obtuse in front with similar profiles. Snout convex, width 4/5 its length. Eye trifle nearer rictus than snout tip. Mouth horizontal, completely closes. Lips thick, fleshy, smooth or with fine papillae. Teeth obtuse or rather sharply pointed, firm, upper anterior to eyes large, with single marginal series and 2 or more median teeth, still larger and semimovable; latter continuous with double series of quite large firmly erect teeth on vomer, these molar-like and begin about opposite front eye edge; mandible with row of small rather obtuse conic teeth, anteriorly 3 or 4 pairs of larger following close after symphysis. Mandible slightly included within upper jaw. Front nostril in fleshy tube each side of snout, 2 in eye. Hind nostril simple pore above eye front. Interorbital evenly convex. Gill opening 2/5 of eye. Along upper lip 8 pores, 10 along mandible; 3 pairs of pores, first near or close to snout tip, second between front nasal tubes, third midway between front and hind nostrils. Dorsal origin about last third between rictus and gill opening. Caudal tip rounded, 1 to 1 1/5 in eye.

Largely whitish with 24 to 28 broad deep brown transverse bands, 11 before vent, only united below in median line after vent. Snout and caudal tip white. Iris pale slaty. With age back entirely and finely sprinkled with pale or obsolete brownish or whitish color between dark blotches. Inside mouth pale.

Variations in color quite frequent. Some specimens greatly variegated with pale ground-color greenish-yellow and dark markings black, in others purplish-brown. Frequently only traces of dark bars on head and hind part of tail. Some specimens almost entirely uniform brownish.

In the Bishop Museum, 15 specimens from Honolulu, 512 to 795 mm. One from Marcus Island, 180 mm. long, is very close to the nominal *Echidna zonata*. It has 27 broad dark cross bars. One from Nukuhiva, 108 mm., with 29 dark crossbars. One from French Frigates Shoal. In the National Museum, 8 Hawaiian specimens, including the types of *Echidna leihala, Echidna zonophaea, Echidna psalion, Echidna obscura, Echidna vincta.* One from Fakarava and 3 from Apia, Samoa, which were obtained May 15, 1883, by W. H. Jones. Three Hawaiian specimens in the Academy, including the types of *Echidna zonata* and *Echidna sauvagei.* In the Agassiz Museum 2 from Hawaii, 1 from Fakarava, and 1 from the Society Islands. Most received from Garrett.

Widely distributed from the Red Sea to the East Indies, Riu Kiu, to Hawaii and Tahiti.

Echidna xanthospila (Bleeker).

Muraena xanthospilos Bleeker: Nat. Tijds. Ned. Ind., vol. 19, p. 349, 1859 (type loc., Karangbollong, Java).

Muraena xanthospila Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 423, 1910 (Samoa).

Echidna xanthospila Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1423, 1906 (Upolu).

Differs from *E. nebulosa* in the head less than 1/3 of trunk. Brown, with numerous round or oval patches. Length 750 mm.

East Indies to Samoa.

Echidna nebulosa (Ahl).

Muraena nebulosa Ahl: Specimen ichth. Mur. Ophich. (Thunberg), p. 7, pl., right figure, June, 1789 (type loc., East India).—Günther: Cat. fishes Brit. Mus., vol. 8, p. 130, 1870 (Fiji).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 38, 1874 (South Sea).—Günther: Rept. voyage "Challenger," vol. 1, p. 58, 1880 (Tahiti).—De Vis: Linn. Soc. New South Wales, Proc., vol. 8, p. 457, 1883 (New Britain).—Regan: Zool. Soc. London, Proc., p. 403, 1909 (Christmas Island).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 423, 1910 (Hawaiian islands).

Echidna nebulosa Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 524, 1900 (Samoa).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 18, 19, 1902 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 429, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 520, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 110, pl. 1, 1903 (1905) (Honolulu; Hilo; Kailua).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1422, 1906 (Upolu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 203, 1905 (1906) (Samoa).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 604, 1908 (Suva, Fiji).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 30, 1912 (Samoa; Hawaiian islands).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 100, 1913 (Saonek).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 348, fig. 170, 1916 (Saonek, Waigiu; New Guinea).—Fowler: Copeia, no. 112, p. 82, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 5, 31, 1925 (Guam; Samoa).—Fowler, op. cit., Bull. 38, p. 6, 1927 (Howland and Baker islands).—Whitley: Australian Mus., Records, vol. 16, no. 1, p. 7, 1927 (New Hebrides; Samoa).

Gymnothorax nebulosa Garman: Mus. Comp. Zool., Bull., vol. 39, p. 239, 1903 (Suva, Fiji).

Gymnothorax nebulosus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 6, 1906 (Shortland Island and Nukuhiva).

Muraena ophis Kittlitz: Denkw. Reis. Mikronesien, vol. 2, p. 20, 1858 (Ualau).

Head 8 1/2 to 9 2/5; depth 11 1/2 to 18 2/5; combined head and trunk long as tail; snout 5 4/5 to 6 in head; mouth 2 2/3 to 3 1/4; interorbital 6; eye 2 in snout; head width 2 1/6 to 3 1/2 in head length. Color quite variable, often dark blotches may be largely black or with but a few pale spots or dots at most. In other cases they may be greatly disseminated by vermiculations or dots of general color.

In the Bishop Museum 10 specimens, 1 each from Marcus Island, Raiatea, Rarotonga, Nukuhiva, and Shortland Island, the others all from Honolulu. Also 1 from Guam in 1923. Largest 635 mm. In the Academy 3 from Samoa and 2 Hawaiian. In the Agassiz Museum 1 Hawaiian, 1 Ebon Island, and 2 Ascension Island, 4 Society Islands, 9 Apiang in the Kingsmill Islands, and 2 from Apia, Samoa. Jouan reports this species as *Muraena*, No. 16 (Soc. Cherbourg, Mem., vol. 8, p. 251, 1861), from Port de France, New Caledonia. Yellowish-green, with small irregular black spots, more large zones of black form as vertical rings, interrupted on flanks and belly. Spots each side of dorsal and impinging on same, marked by yellow dots. Length 420 mm.

Widely distributed from East Africa to the East Indies, Australia, China, Hawaii and Tahiti.

Echidna delicatula (Kaup).

Poecilophis delicatulus Kaup: Cat. apodal fish, p. 102, 1856 (type loc., Moluccas).

Echidna delicatula Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 204, 1905 (1906) (Pago Pago).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 100, 1913 (Saonek near Waigiu).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 350, 1916 (Saonek).

Echidna trossula (Jordan and Starks) Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 203, fig. 8, 1905 (1906) (type loc., Apia and Pago Pago).

Differs from *E. amblyodon* in the dorsal origin far before gill openings. Length 440 mm.

Ten in the National Museum from Samoa.

East Indies to Japan and Samoa.

Echidna amblyodon (Bleeker).

Muraena amblyodon Bleeker: Soc. Ind. Neerl., Act. (Manado), vol. 1, p. 72, 1856 (type loc., Manado, Celebes).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 420, 1910 (Samoa; Guam; Marquesas Islands).

Echidna amblyodon Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Savay).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 12, 1906 (Nukuhiva, Marquesas Islands).—Fowler: B. P. Bishop Mus., Bull. 20, p. 31, 1925 (Samoa).

Echidna delicatula (non Kaup) Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 204, 1905 (1906) (Pago Pago).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 32, 1912 (Apia).

Head 7 2/5; depth 13; head width 3 in its length; head depth 1 5/6; snout 6 3/4; eye 7; mouth 2 1/6; interorbital 6 2/3; head 3 2/3 to vent.

Body well compressed, stout tail tapering rather suddenly. Head rather deep, well compressed. Snout convex, long as wide. Eye midway between rictus and snout tip. Mouth closing, horizontal. Lips fleshy, smooth. Upper teeth before eyes enlarged, conic, strong, outer marginal series firmly erect and median row of 2 still larger and slightly movable ones. Vomer with somewhat irregular series of smaller partly molar teeth. Upper lateral teeth biserial, outer row of very small firmly set teeth, inner row equally long. Mandibular teeth marginal row of very small close-set erect conic teeth, forward inner row of 5 pairs of longer conic depressible teeth. Mandible slightly included within upper jaw. Front nostril in short fleshy tube each side of snout tip. Hind nostril simple pore over each eye. Gill opening 1 1/2 in snout. Upper lip with 8 pores, lower with 10. Dorsal origin about opposite last fourth between rictus and gill opening. Caudal long as eye.

Uniform brownish-dusky, under a lens minutely vermiculated with pale grayish lines over entire body, largely obsolete over muzzle, mandible and caudal. Iris pale slaty. Rictus and gill opening like adjacent color. Length 140 mm.

One in the Agassiz Museum from Society Islands. One from Apia in the Academy. Two in the Bishop Museum from Nukuhiva: vomerine teeth biserial, dorsal origin slightly before gill-openings.

Weber and Beaufort have separated *Echidna delicatula* from *Echidna amblyodon*, on the dorsal origin well advanced to gill opening and vomerine teeth biserial; while in *Echidna amblyodon* the dorsal origin is little advanced and the vomerine teeth are uniserial. The species *Echidna trossula* is described with "a patch of blunt teeth, usually in two rows, but sometimes in one or irregularly in two." As the dorsal origin in my specimens is all more posterior I have identified them with *Echidna amblyodon*.

The species ranges from the East Indies to Samoa and the Marquesas.

Rhinomuraena quaesita Garman.

Rhinomuraena quaesita Garman: Essex Inst., Bull., p.

114, 1888 (type loc., Ebon Island, Marshall Group).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 427, 1910 (copied).

Nettastomops barbatula Steindachner: Akad. Wiss. Wien, Anz., vol. 17, p. 21, 1906 (type loc., Upolu).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1421, 1906 (type).

? Ophichthys macrops Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 402, pl. 166, fig. a, 1910 (type loc., Kingsmill Islands).

Unique among the morays by the large terminal nasal barbel with 2 long flaps and the 3 terminal mandibular barbels.

The type, 830 mm. long, without barbels, in the Agassiz Museum, from Ebon Island.

Ophichthys macrops Günther, was described from the figure of a specimen found in the Kingsmills, by Garrett. As Garrett's figure is obviously incomplete, if not inaccurate, it may provisionally be referred to *Rhinomuraena quaesita.*

Evenchelys macrurus (Bleeker).

Muraena macrurus Bleeker: Nat. Tijds. Ned. Ind., vol. 7, p. 324, 1854 (type loc., Anjer, Sunda Straits).—Weber: Nova Guinea, vol. 5, pt. 2, p. 227, 1908 (Merauke River mouth, southern New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 421, 1910 (Pelew Islands).

Readily distinguished by the long tail, the combined head and trunk 1 1/2 to 2 in tail. Reaches over 3000 mm. in length.

Widely distributed from Natal to the East Indies, Formosa, and the Pelew Islands.

Muraenophis pardalis (Schlegel).

Muraena pardalis Schlegel: Fauna Japonica, Poiss., pts. 10-11, p. 268, pl. 119, 1846 (type loc., Japan).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 408, 1910 (Savaii; Tahiti).

Muraena kailuae Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 165, 1902 (1903) (type loc., Kailua, Hawaii).—Snyder: op. cit., vol. 22, p. 518, 1902 (1904) (Napili Harbor, Maui; Honolulu).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 941, 1904 (Honolulu; Laysan).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 88, pl. 9, figs. 20-21, 1903 (1905) (types; Hawaiian material).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 196, 1905 (1906) (Honolulu).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 604, 1908 (Suva, Fiji).

Muraena lampra Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 423, fig. 3, 1902 (1903) (type loc., Honolulu).

Muraena kauila Jenkins: U. S. Fish Comm., Bull., vol. 22, fig. 4, p. 424, 1902 (1903) (type loc., Honolulu).

Head 6 1/2; depth 9 4/5; combined head and trunk but slightly less than rest of body; snout 4 2/3 in head; eye 12; mouth 2; interorbital 12; gill opening equals eye. Front nasal tube 1/3 length of hind one, which 1 1/4 in snout. Teeth in jaws with series of enlarged inner ones and outer row small; large depressible fang on vomer, followed by 3 smaller on base of skull.

Markings all very close-set yellow spots with dark edges, larger and more or less as streaks and bars on under surface, though largely their edges blackish. Inside mouth speckled or blotched. Vertical bands blackish, 19.

In the Bishop Museum 1 from Honolulu 731 mm. long. In the Agassiz Museum 2 from the Society Islands obtained by Andrew Garrett. Edmondson reported one in the tank at the Waikiki Laboratory. It is now (1922) about 508 mm. long. In captivity two years, having grown probably 203 mm. and increased in diameter. The coloration has remained about the same as when first captured, when very savage. It afterwards became tame and readily submits to having its neck rubbed, though will not allow removal from the water.

Muraenophis pavonina (Richardson).

Muraena pavonina Richardson: Voyage "Sulphur," Fishes, p. 110, pl. 53, figs. 1-6, 1844 (no type locality).—Günther: Cat. fishes Brit. Mus., vol. 8, p. 98, 1870 (type; "southern seas").

Hind nostril equals vertical eye diameter. Mouth completely closing. Eye more than half of snout. Brownish-black, with oval white spots large as or larger than eye. Rictus and gill opening black. Inside mouth spotted with black. Length 242 mm. (Günther).

One in the National Museum, without locality, may have been obtained in Oceania.

Strophidon brummeri (Bleeker).

Muraena brummeri Bleeker: Nat. Tijds. Ned. Ind., vol. 17, p. 137, 1858-59 (type loc., Atapupu, Timor).

Muroena brummeri De Vis: Linn. Soc. New South Wales, Proc., vol. 8, p. 457, 1883 (Api).

Strophidon brummeri Schmeltz: Mus. Godeffroy, Cat. 6, p. 18, 1877 (Raiatea).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1423, 1906 (Upolu).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 420, 1910 (type of *Muraena taenioides;* Samoa; Huahine).

Muraena (Strophidon) brummeri Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 359, 1916 (New Guinea).

Muraena taenioides Günther: Zool. Soc. London, Proc., p. 674, 1871 (type loc., Savay).

Strophidon polyodon Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 38, 1878 (New Guinea).

Differs from *Lycodontis* in the very slender body, depth 40 to 51 and the head more than 12. Length 800 mm.

Madagascar to the East Indies, Japan and Samoa.

Lycodontis picta (Ahl).

Muraena picta Ahl: Specimen ichth., Ophich., p. 8, pl. (right figure), 1789 (type loc., East India).—Streets: U. S. Nat. Mus., Bull., vol. 7, p. 93, 1877 (Palmyra Island).—Peters: Akad. Wiss. Berlin, Monatsb., p. 850, 1876 (1877) (New Hannover).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 228, 1898 (Mariannes).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 419, 1910 (Hawaiian islands; Carolines; Guam; Marquesas; Fiji; New Lauenburg on Duke of York Island; Kingsmills; Samoa; Society Islands).

Gymnothorax pictus Bleeker: Atlas ichth., vol. 4, p. 87, pl. (26) 170, figs. 3-4; pl. (28) 172, fig. 3; pl. (29) 173, fig. 1; pl. (45) 189, fig. 3, 1864 (New Guinea).—Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 281, 1868 (Doreh, New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Samoa).—Waite: Austral. Mus., Records, vol. 5, p. 3, 1903 (Nauru, Pleasant Island, Marshall Group).—Garman: Mus. Comp. Zool., Bull. 39, p. 239, 1903 (Suva and Nukulau Island, Fiji).—Snyder: U. S. Fish Comm., Bull., vol. 22, p. 518, 1902 (1904) (Honolulu; Puako Bay, Hawaii).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 103, pl. 19, 1903 (1905) (Kailua; Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 6, 1906 (Shortland Island, Solomons, Makatea, Paumotus, Mangareva, Gambier Islands; Tahiti, Rarotonga, Cook Islands).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol

25, p. 198, 1905 (1906) (Apia).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 604, 1908 (Suva, Fiji).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 246, 1911 (Anea, Fakarava, Makemo, Tikei, Rangiroa, Paumotus; Funafuti, Ellice Islands; Jaluit, Marshall Islands).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 25, 1912 (Hawaiian islands).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 113, 1922 (Pago Pago).—Fowler: Copeia, no. 112, p. 82, Nov. 20, 1922 (Hawaii).

Muraena (Gymnothorax) picta Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 363, figs. 175, 180, 182, 183, 1916 (Doreh and Humboldt Bay, New Guinea).

Lycodontis picta Fowler: B. P. Bishop Mus., Bull. 22, p. 5, 1925 (Guam); op. cit., Bull. 38, p. 6, 1927 (Fanning, Christmas, Jarvis, Tongareva, Howland, Baker islands, Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 6, 1925 (Johnston and Wake islands).

Gymnothorax echidna Suckow: Naturges., vol. 4, p. 181, 1799 (not consulted).—Schneider: Systema ichth., Bloch, p. 526, 1801 (Huahine, Tahiti).

Muraenophis pantherina Lacépède: Hist. nat. Poiss., vol. 5, pp. 628, 642, 1803 (no type locality [la collection hollandoise]).

Sidera pantherina Kaup: Cat. apodal fish, p. 71, 1856 (New Guinea).

Muraena variegata Quoy and Gaimard: Voyage "Uranie," Zool., p. 246, pl. 52, fig. 1, 1824 (type loc., Guam; Coromandel).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Upolu).

Echidna variegata Lichtenstein: Descriptiones animalium, Forster, p. 181, 1844 (Huahine; Bola Bola; Tongatabu).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Samoa).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 38, 1878 (New Guinea).

Muraenophis variegata Jouan: Soc. Sci. Nat. Cherbourg, Mem., vol. 9, p. 183, 1863 (on *Muraena* Jouan, op. cit., vol. 8, p. 251, 1861, Port de France, New Caledonia).

Muroenophis variegata Jouan: Soc. Sci. Nat. Cherbourg, Mem., vol. 21, p. 333, 1877-78 (New Caledonia).

Poecilophis variegata Kner: Reise "Novara," Fische, vol. 1, pt. 5, p. 381, 1865 (Tahiti).

Muraena sidera Richardson: Voyage "Erebus" and "Terror," Ichth., p. 85, pl. 48, figs. 1-5, 1844-48 (type loc., West and North Australia).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 594, 1882 (New Guinea).

Muraena nigrolineata Kaup: Cat. apodal fish, p. 56, 1856 (type loc., Marquesas Islands).

Muraena chrysops Kaup: Cat. apodal fish, p. 70, 1856 (type loc., Tahiti).

Muraena nebulosa (non Bloch) Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 127, 1903 (Marcus Island).

Gymnothorax nuttingi Snyder: U. S. Fish Comm., Bull., vol. 22, p. 518, pl. 4, fig. 7, 1902 (1904) (type loc., Honolulu).

Gymnothorax litus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 198, 1905 (1906) (Apia).

Gymnothorax polyophthalmus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 199, 1905 (1906) (Apia and Kusaie, Carolines).

Muraena goldsboroughi (non Jordan and Evermann) Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 418, 1910 (part).

Gymnothorax punctatus (non Schneider) Fowler and Silvester: Carnegie Inst., Marine Pap., p. 112, 1922 (Pago Pago).

Head 4 to 7 1/3; depth 13 1/4 to 18; combined head and trunk very slightly longer than tail, in very young about equal; snout 5 1/4 in head measured from upper jaw tip; mouth cleft 2 3/5 to 3 1/6; interorbital 6 2/3 to 7; head width 2 4/5 to 3 1/2 in total head length; eye 1 2/3 to 2 1/2 in snout. Small V-shaped patch of low, simple teeth on vomer; jaw teeth uniserial, compressed, none especially canine like.

Ground-color grayish-white, everywhere dotted or finely spotted with dusky to blackish, dots extremely fine and numerous, though few if any extend on medial line of belly. In very young body white and blackish dots less numerous, some formed as 4 or 5 rows of small black rings. In none of smallest examples with dark spots invading white belly.

In the Bishop Museum 16 specimens, of which 3 from the Honolulu markets, others from Makatea, Mangareva, Shortland Island, Marcus Island, Palmyra Island (C. Montague Cooke in 1914 and Thurston and Thaanum in 1922) and Fanning Island (Ball and Edmondson in 1922). I saw an adult specimen in the Honolulu markets December 17, 1922. The largest specimen is from Palmyra, obtained by Thurston and Thaanum, and though the tip of its tail is damaged, measures 1393 mm. The spots are not nearly so numerous as in most other specimens, though along the sides they resolve into several rather distinct rows of large irregular blackish rings, some with a median spot. None of the spots or dots extend on the belly. Two also from Johnston Island; 3 from Wake Island; 1 from Guam in 1923. In the National Museum 26 specimens from Honolulu, including the type of *Gymnothorax nuttingi*, others from Samoa, Fannings, Rangiroa, Makemo, Arno Atoll, Tikei and Jaluit. One from Kailua in the Academy. In the Agassiz Museum 3 from the Society Islands, 1 from Hawaii, 10 from Apiang, in Kingsmill Islands, 4 from Ascension Island and 7 from Ebon Island, and 1 from Strong's Island (Kusaie), Caroline Islands.

Though I have been inclined to separate specimens with very finely dotted color-pattern, immaculate lower region of head and body as *Gymnothorax punctatus* Schneider, further series of specimens convince me that all are really variants. The usual types of variation are well set forth by Weber and Beaufort. In life the usual ground-color is bright yellow. Possibly *Muraena net* Thiollière (Fauna Woodlark, 1857, p. 210, type loc., Woodlark Island) may be this species. The incomplete account describes the coloration as: "Uniform fawn on the back and the lower surface whitish. Eye yellow. Some mobile teeth on vomer. Length 300 mm."

Widely distributed from Natal and Eastern Africa to the East Indies, Riu Kiu, Hawaii, and Tahiti.

Lycodontis thyrsoidea (Richardson).

Muraena thyrsoidea Richardson: Voyage "Sulphur," Fishes, p. 111, (non pl. 49, fig. 1), 1844 (type loc., China Seas, Canton).—Schmeltz: Mus. Godeffroy, Cat. 5, p.

38, 1874 (Samoa).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 514, 1901 (French Pass).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 419, 1910 (Ponapé; Guam; Faté; Tubuai; Samoa; Tonga; Fiji).

Gymnothorax thyrsoideus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 9, 1906 (Faté, New Hebrides; Tubuai, Austral Islands).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 198, 1905 (1906) (Pago Pago).

Muraena griseo-badia Richardson: Voyage "Erebus" and "Terror," Ichth., p. 89, 1844-48 (type loc., Tonga Islands).

Gymnothorax griseo-badius Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 38, 1878 (New Guinea).

Thyrsoidea arenata Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Samoa).

Head 10 1/2 to 13; depth 15 4/5 to 18; snout 4 4/5 to 5 2/5 in head; mouth 2 3/5 to 3; interorbital 6 1/4 to 6 1/2; eye 1 3/4 to 1 4/5 in snout. Combined head and trunk 1 3/5 to 1 3/4 in tail. Head width 3 to 3 1/2. Upper teeth in jaws biserial, also vomerine; mandibular teeth uniserial. Snout conic, width 1 1/5 in its length. Front eye edge midway between snout tip and rictus. Front nasal tube moderate. Gill opening nearly wide as eye. Dull brown generally, with small close-set variable dusky or dark dots and spots. Anteriorly, between eye and gill opening sooty shade, though blotches strongly evident through same. Muzzle pale or whitish. No dark blotch at rictus or gill opening. Edges of both dorsal, anal and caudal distinctly pale to whitish, especially anal.

In the Bishop Museum one from Faté, 260 mm. and another from Tubuai, 360 mm. In the National Museum one from Samoa. In the Agassiz Museum 1 from the Society Islands and 1 from Apiang, the Kingsmill Islands. I cannot detect the "skin with scale pouches" as claimed by Günther. My specimens approach *Gymnothorax prosopeion* Bleeker (Atlas ichth., vol. 4, p. 88, pl. 39, fig. 3, 1864), though his figure shows the end of the muzzle dark, a dark submarginal anal line and the dorsal edge of uniform color with rest of fin.

East Indies to China, Micronesia, Samoa and Austral Islands.

Lycodontis schismatorhynchus (Bleeker).

Muraena schismatorhynchus Bleeker: Nat. Tijds. Ned. Ind., vol. 4, p. 301, 1853 (type loc., Benkulen, Sumatra).

Muraena (Gymnothorax) schismatorhynchus Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 366, fig. 184, 1916 (type).

Rhinamuraena eritima Jordan and Seale: (U. S.) Bur. Fish., vol. 25, p. 196, fig. 6, 1905 (1906) (type loc., Pago Pago, Samoa).

Snout long and narrow, gape wide and hind nostrils with an elevated tubiform rim. Gray-brown, paler below. Length over 800 mm.

Muraena net Thiollière (Fauna Woodlark, p. 210, 1857, type loc., Woodlark Island) is very incompletely noticed: The body short, robust, diminishes in depth from first sixth of its length. Eye over mouth-cleft. Row of pointed teeth, directed backward in each jaw and some other mobile teeth on vomer. Fawn color upon the back, whitish below. Iris yellow. Not exceeding 912 mm. Possibly it may refer to the present species?

East Indies to Samoa.

Lycodontis meleagris (Shaw and Nodder) (Pl. II, *A*).

Muraena meleagris Shaw and Nodder: Naturalist's miscellany, vol. 7, pl. 220, 1795 (type loc., Southern Ocean).—Günther: Cat. fishes Brit. Mus., vol. 8, p. 100, 1870 (Fiji).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 38, 1874 (Tonga).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 410, 1910 (Samoa; Hawaiian islands; Society Islands; Fiji; Ponapé; Friendly Islands; Carolines; Tahiti; Paumotu).

Gymnothorax meleagris Snyder: U. S. Fish Comm., Bull., vol. 22, p. 518, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 94, 1903 (1905) (Honolulu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 197, 1905 (1906) (Apia).—Fowler: Copeia, no. 112, p. 82, Nov. 20, 1922 (Hawaii).

Muraena (Gymnothorax) meleagris Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 367, 1916 (New Guinea).

Lycodontis meleagris Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 6, 1925 (Laysan, French Frigates Shoal, Lisiansky, Ocean, and Johnston islands).—Fowler: op. cit., Bull. 38, p. 6, 1927 (Palmyra, Washington, Fanning, Tongareva, Howland islands).

Thyrsoidea eurosta Abbott: Acad. Nat. Sci. Philadelphia, Proc., p. 478, 1860 (type loc., Hawaiian islands).

Lycodontis eurosta Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 494, pl. 18, fig. 4, 1900 (type).

Gymnothorax eurostus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 21, 1912 (type).

Muraena duivenbodei Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 228, 1898 (Mariannes).

Lycodontis parvibranchialis Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 494, pl. 18, fig. 1, 1900 (type loc., Hawaiian islands).

Muraena laysana Steindachner: Akad. Wiss. Wien, Anz., vol. 16, p. 177, June 27, 1900 (type loc., Laysan Island).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 515, pl. 6, figs. 1-2, 1901 (type).

Gymnothorax laysanus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 425, fig. 5, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 518, 1902 (1904) (Honolulu; Hilo).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 942, 1904 (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, p. 93, pl. 12 and fig. 22, 1903 (1905) (Honolulu; Waikiki; Cocoanut Island; Hilo).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 21, 1912 (type of *Lycodontis parvibranchialis*).

Muraena nigra (non Risso) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 62, 1900 (1901) (Guam).

Gymnothorax leucostictus Jenkins: U. S. Fish Comm., vol. 22, p. 425, fig. 5, 1902 (1903) (type loc., Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 15, 1902 (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 96, fig. 25, 1903 (1905) (Honolulu).

Gymnothorax ercodes Jenkins: U. S. Fish Comm., Bull. vol. 22, p. 428, fig. 8, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull. vol. 23, pt. 1, p. 95, fig. 24, 1903 (1905) (Honolulu).

Gymnothorax tahitensis Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 7, pl. (lower right figure), 1906 (type loc., Tahiti).

Gymnothorax marquesensis Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 10, fig. 1, 1906 (lower left figure) (type loc., Nukuhiva, Marquesas Islands).

Gymnothorax chalazius Seale: B. P. Bishop Mus.,

Occ. Papers, vol. 4, no. 1, p. 10, 1906 (Tubuai, Austral Islands).

Gymnothorax dovii (non Günther) Kendall and Goldsborough: Mus Comp. Zool., Mem., vol. 25, p. 82, 1912 (Cook Bay, Easter Island).

Head 7 to 7 4/5; depth 9 2/3 to 13 1/5; head and trunk combined slightly shorter than robust tail; snout 5 1/5 to 5 1/2 in head measured from upper jaw tip; mouth cleft 2 1/5 to 2 1/3; interorbital 5 3/4 to 6 1/5; head width 2 to 3 in total head length; eye 1 4/5 to 2 3/4 in snout.

Great variation is seen in the size of the white spots or dots. In the largest specimen they are very small and in very great numbers, the dark interspaces greatly wider. Other specimens have much larger spots, though in none larger than the eyes, and on many the interspaces regularly wider or narrower. The disposition of the spots is also irregular on many specimens, with crowded appearance in places. In many small specimens there is a tendency to sparseness or slight enlargement of spots progressively posteriorly on tail. Tip of tail whitish on some.

In the Bishop Museum 42 specimens, from Honolulu; Honomumi on Molokai in July 1914; French Frigates Shoal; Johnston Island; Laysan, Lisiansky and Ocean islands; Nukuhiva, Tahiti, Tubuai and Guam; including the types of *Gymnothorax tahitensis* and *Gymnothorax marquesensis*. During December 1922, I examined 10 others in the Honolulu markets. The largest specimen of all was 1241 mm. in length. In the National Museum 2 specimens were obtained by the Wilkes Expedition, one at Fiji, the other without locality; also 7 others from Hawaii, from the Bureau of Fisheries, including the types of *Gymnothorax ercodes* and *Gymnothorax leucostictus;* 1 from Samoa and 2 from Easter Island. In the Academy 2 Hawaiian, the types of *Thyrsoidea curosta* Abbott and *Lycodontis parvibranchialis*. Two others, without data, are doubtless Hawaiian. In the Agassiz Museum 12 from the Hawaiian islands, 1 from Apia, 2 from the Society Islands, and 1 from Ebon Island.

Ranges from East Africa to the East Indies, Japan, Hawaii and Tahiti.

Lycodontis polyuranodon (Bleeker).

Muraena polyuranodon Bleeker: Nat. Tijds. Ned. Ind., vol. 5, p. 248, 1853 (type loc., Ceram).—Günther: Rept. voyage "Challenger," vol. 1, p. 36, 1880 (Ovalau, Fiji).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 421, 1910 (Ovalau, in fresh water).

Gymnothorax polyuranodon Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 301, 1868 (Waigiu).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Kandavu).

Muraena (Gymnothorax) polyuranodon Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 369, fig. 185, 1916 (Waigiu; Humboldt Bay, North New Guinea).

Differs from *L. meleagris* in the smaller mouth-cleft, 3 1/2 in head and latter 4 or 5 in trunk. Length 700 mm.

Two in the Agassiz Museum, from Ebon Island.

East Indies to Fiji.

Lycodontis tile (Buchanan-Hamilton) (Pl. II, *B*).

Muraenophis tile Buchanan-Hamilton: Fishes of Ganges, pp. 18, 363, 1822 (type loc., Ganges estuaries near Calcutta).

Gymnothorax tile Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 375, 1923 (Honolulu).

Head 7 4/5; depth 10 1/3; snout 5 2/3 in head measured from upper jaw tip; mouth 2 7/8; interorbital 7; eye 2 4/5 in snout. Combined head and trunk slightly longer than slenderly acuminate tail. Head width 2 4/5 its length. Snout obtusely conic, length 7/8 its width; more attenuate in profile than as viewed from above. Eye small, closer to upper profile than to mouth. Jaws strong, lower very slightly protruded. Rictal groove extends back 2/5 to gill opening. Teeth in jaws entire, compressed, rather broad, uniserial and nearly uniform; below eye 1 or 2 auxiliary inner teeth like outer row of jaw teeth; median row of small inconspicuous teeth on vomerine shaft. Anterior nostril in well developed tube. Hind nostril close before and above front eye edge, rim moderately elevated. Gill opening 1 2/5 in snout.

Mauve-brown generally, largely uniform. Everywhere with minute pale to whitish dots, bars, blotches, circles, variable in the extreme and little contrasted with ground color. On head anteriorly extremely minute, crowded and obsolete on hind part of body with markings same size as on trunk, though little more sparse. Markings also extend on fins, which same as ground color. Gill opening with dusky margin. Angle of gill opening like general color of pharynx.

One in the Bishop Museum, 1051 mm. long, obtained in the Honolulu market. This I identify as the adult of *Lycodontis tile*. From *Gymnothorax tile* Bleeker (Atlas ichth., vol. 4, p. 97, pl. 178, fig. 1, 1864), and *Muraena tile* Day (Fishes of India, pt. 4, p. 668, pl. 170, fig. 4, 1878), it differs in that neither are shown with a dark border around the gill opening. The color-pattern, though doubtless a condition of age, is in uniformity, indicating a great range in variation. The species has not previously been found in Oceania.

Lycodontis petelli (Bleeker).

Muraena petelli Bleeker: Nat. Tijds. Ned. Ind., vol. 11, p. 84, 1856 (type loc., Malang, Java).—Boulenger: Ann. Mag. Nat. Hist., 6th ser., vol. 20, p. 374, 1897 (Rotuma Island).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 412, 1910 (Samoa; Rotuma Island).

Lycodontis petelli Fowler and Ball: B. P. Bishop Mus., Bull. 25, p. 6, 1925 (Wake Island).—Fowler: op. cit., Bull. 28, p. 6, 1927 (Tongareva, Baker Island, Honolulu).

Gymnothorax petelli Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Savay).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 100, fig. 27, 1903 (1905) (Honolulu; Samoa).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 197, 1905 (1906) (Pago Pago; Apia).

Gymnothorax leucacme Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 427, fig. 7, 1902 (1903) (type loc., Honolulu).—Snyder: op. cit., vol. 22, p. 518, pl. 6, fig. 1, 1902 (1904) (Honolulu).

Gymnothorax waialuae Snyder: U. S. Fish Comm., Bull., vol. 22, p. 520, pl. 6, fig. 11, 1902 (1904) (type

loc., Waialua Bay, Oahu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 97, pl. 13, fig. 1, 1903 (1905) (type).

Head 7 1/8 to 8 3/5; depth 11 2/3 to 12 1/8; snout 5 to 5 2/5 in head; mouth 2 to 2 1/4; interorbital 8 to 8 1/2; head width 2 4/5 to 3; eye 2 in snout; gill opening 1 2/5 to 2. Head and trunk slightly less than tail. Teeth compressed, triangular, uniserial; 2 large depressible canines on front of vomer. General color dull purplish-brown, with 17 to 20 broad darker cross-bands, wide as interspaces, some variably confluent on median line of belly, but all at least extend on vertical fins. Pale interspaces on edge of anal usually much paler than general body color, some even whitish.

In the Bishop Museum 6 specimens, 658 to 869 mm. from Honolulu. In the Honolulu market I examined 2 on November 11, 1922 and 1 on November 25. One from Wake Island in July 1923. In the National Museum 5 Hawaiian specimens, including the types of *Gymnothorax leucacme* and *Gymnothorax waialuae;* also 2 from Samoa, adults. In the Agassiz Museum 4 Hawaiian specimens and 1 from Apiang, Kingsmill group.

From Mauritius and Red Sea to the East Indies to Riu Kiu and Hawaii.

Lycodontis ruppelli (McClelland).

Dalophis rupelliae McClelland: Calcutta Jour. Nat. Hist., vol. 5, p. 213, 1845 (on Rüppell).

Muraena ruppellii Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 412, 1910 (Ponapé; Samoa; Kandavu).

Gymnothorax rupelliae Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 247, 1911 (Rangiroa, Paumotus).

Muraena (*Gymnothorax*) *rüppelli* Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 372, 1916 (Humboldt Bay and German New Guinea).

Muraena reticulata (non Bloch) Rüppell: Atlas Reis. Nord. Afrika, Fisch., p. 117, 1828.

Gymnothorax reticulatus Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Samoa).—Schmeltz: op. cit., Cat. 5, p. 38, 1874 (Kandavu).

Muraena reticularis (non Bloch) Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1423, 1906 (Upolu).

Differs from *Lycodontis petelli* in 15 to 20 crossbands encircling body, much narrower than interspaces and first through eye. Length 550 mm.

One in the Agassiz Museum from Apiang, in the Kingsmill Islands. Young specimen in the National Museum from Rangiroa.

Red Sea to East Indies, to Samoa and Tuamotus.

Lycodontis flavomarginata (Rüppell) (Pl. II, *C*).

Muraena flavomarginata Rüppell: Atlas Reis. Nord. Afrika, Fisch., p. 119, pl. 30, fig. 3, 1828 (type loc., Red Sea).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 38, 1874 (Savay).—Günther: Rept. voyage "Challenger," vol. 1, p. 61, 1880 (Honolulu).—Boulenger, Ann. Mag. Nat. Hist., 6th ser., vol. 20, p. 374, 1897 (Rotuma Island).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 417, 1910 (Hawaiian islands).

Gymnothorax flavimarginatus Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 38, 1878 (New Guinea).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 99, pl. 17, 1903 (1905) (Honolulu; Hilo; Waikiki).

Gymnothorax flavomarginatus Waite: Australian Mus., Records, vol. 5, p. 3, 1903 (Poanopa, Ocean Island, Gilbert Group).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 200, 1905 (1906) (Apia).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, pt. 1, p. 9, 1906 (Tubuai, Austral Islands; Raiatea, Society Islands).

Muraena (*Gymnothorax*) *flavimarginata* Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 374, 1916 (Humboldt Bay, New Guinea).

Lycodontis flavimarginata Fowler: B. P. Bishop Mus., Bull. 22, p. 23, 1925 (Honolulu); op. cit., Bull. 38, p. 6, 1927 (Honolulu).

Lycodontis flavomarginata Fowler: B. P. Bishop Mus., Bull. 22, p. 31, 1925 (Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 6, 1925 (Laysan and Wake islands).—Fowler: op. cit., Bull. 38. p. 6, 1927 (Honolulu).

? Muraenophis grisea Lacépède: Hist. nat. Poiss., vol. 5, pp. 629, 642, 644, 1801 (no type locality; New Britain evidently intended).

Gymnothorax favagineus (non Schneider) Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Samoa).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1; p. 7, 1906 (Faté, New Hebrides).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 199, 1905 (1906) (Pago Pago).

Gymnothorax griseobadius Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Savay).

Gymnothorax javanicus Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Kandavu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 200, 1905 (1906) (Apia).

Gymnothorax buroensis (non Bleeker) Schmeltz: Mus. Godeffroy, Cat. 5, p. 38, 1874 (Samoa).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 200, 1905 (1906) (Apia; Kusaie).

Muraena buroensis Waite: Australian Mus., Mem., no. 3, p. 196, 1897 (Funafuti, Ellice Islands).

? Muraena mauritiana Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 38, 1878 (New Guinea).

Muraena formosa Waite: Australian Mus., Mem., no. 3, p. 195, 1897 (Funafuti).

Gymnothorax thalassopterus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 427, pl. 2, 1902 (1903) (type loc., Honolulu).—Snyder: op. cit., vol. 22, p. 518, 1902 (1904) (Honolulu).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 942, 1904 (Honolulu).

Gymnothorax rhodocephalus Seale: B. P. Bishop Mus., Occa. Papers, vol. 6, no. 1, p. 6, 1906 (Rarotonga, Cook Islands).

Gymnothorax batuensis Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 22, 1912 (Apia).—Fowler: Copeia, no. 112, p. 82, Nov. 20, 1922 (Hawaii).

Head 6 3/4 to 8 2/3; depth 10 to 16 3/5; snout 5 to 5 2/3 in head; eye 8 1/2 to 11; mouth 1 7/8 to 2 1/4; interorbital 6 to 6 4/5.

Body compressed, tail tapering rather suddenly though slenderly behind; combined head and trunk equal tail or slightly greater; head 3 3/4 to 3 7/8 to vent. Head width half its length. Muzzle rather obtusely convex, snout long as wide. Eye midway in snout length. Mouth completely closes, nearly horizontal. Lips rather tough, moderately thick, finely papillose. Teeth in jaws uniserial, entire, only anterior above little larger; row of 2 or 3 large rather slender, depressible, conic canines above, last often longest or erect; below eye close inside outer erect teeth, row of 3 conic depressible, slender, palatine teeth, much longer than upper outer; vomerine teeth small, inconspicuous, largely uniserial; 3 pairs of large conic canines anterior to first pair at mandible, third pair often longest and depressible, others erect. Front nostril in short tube near snout tip. Hind nostril simple pore over eye in interorbital space. Gill opening nearly horizontal, long as eye. Four pores along each upper lip, first behind and below nasal tube, third and fourth below eye; pair of pores on upper lip anteriorly, another pair between nasal tubes and third pair on snout

above midway in its length. Dorsal origin about last 2/5 between hind eye edge and gill opening. Caudal 1 1/2 in snout.

Dull brown or dusky generally, with sooty tinge, usually finely and completely mottled or speckled with darker, which pattern extends on vertical fins. Head largely with swarthy appearance in some examples. Hind dorsal, caudal and anal edges often very narrowly pale or whitish. Blackish clouded blotch around gill opening, sometimes in rictal fold with age. Often muzzle quite dark.

Six specimens from Honolulu in the Bishop Museum, largest 1228 mm. One from Wake Island and 1 from Laysan in 1923. I examined 10 large specimens in the Honolulu markets during December 1922 and January 1923. Three smaller ones in the Bishop Museum from Tubuai, Raiatea and Rarotonga. In the National Museum 12 specimens from Samoa and 7 from Hawaii, including the types of *Gymnothorax thalassopterus*. One in the Academy from Apia, Samoa, 252 mm. In the Agassiz Museum 3 Hawaiian, 9 from the Society Islands and 1 from Apiang, Kingsmill Islands.

Ranges from Eastern Africa to the East Indies, Formosa, Hawaii, and the Society Islands.

Lycodontis kidako (Schlegel).

Muraena kidako Schlegel: Fauna Japonica, Poiss., pts. 10-14, p. 266, pl. 117, 1846 (type loc., Bay of Nagasaki).

Lycodontis kidako Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 6, 1925 (Necker, French Frigates Shoal, Laysan).

Muraena flavomarginata (non Rüppell) Günther, Rept. voyage "Challenger," vol. 1, p. 61, 1880 (Honolulu).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 514, pl. 6, fig. 3, 1901 (Laysan).

Gymnothorax steindachneri Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 166, 1902 (1903) (type loc., Honolulu).—Jenkins, op. cit., p. 426 (Honolulu).—Snyder, op. cit., vol. 22, p. 518, 1902 (1904) (Honolulu).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 942, 1904 (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1. p. 101, fig. 28, 1903 (1905) (Honolulu).

Muraena steindachneri Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 417, 1910 (Hawaiian islands).

Head 6 2/3 to 6 7/8; depth 11 to 14 4/5; snout 4 4/5 to 5 3/4 in head; mouth 2 1/8 to 2 1/2; interorbital 6 2/3 to 8; head width 2 7/8 to 3 1/2; eye 1 1/2 to 2 in snout. Head and trunk slightly shorter than tail. Very variable in color. In youngest dark body spots most distinct and contrasted, not or scarcely apparent in largest specimens, which vary from very finely to quite coarsely spotted. In finely specked adults spots smaller and less distinct on median line of belly. All have characteristic black rictal and gill opening blotch.

Five in the Bishop Museum from Honolulu, largest 792 mm. Also 1 from Laysan, obtained by W. A. Bryan in 1903, is 339 mm.; 1 from Necker Island; 1 from French Frigates Shoal, 535 mm.; 1 from Laysan in 1923. In the National Museum 5 Hawaiian, one the type of *Gymnothorax steindachneri*. Two in the Agassiz Museum from Hawaii.

Jordan and Evermann state that their nominal *Gymnothorax steindachneri* differs "much in coloration, being much paler and less reticulated, the angle of the mouth with more black, the gill opening surrounded by a broad black area (nearly or quite absent in *G. kidako*), and the white border to the dorsal fin much more distinct." Jordan and Snyder (U. S. Nat. Mus., Proc., vol. 23, p. 881, 1901) describe "angle of mouth black," dorsal "colored like the body with dark brown and white mottlings" and the "anal black with a very distinct white margin." It appears that Hawaiian material before me varies considerably, sometimes both dorsal and anal with white edges, or at least on hind part of dorsal. Usually only the anal has a broad white edge. I cannot detect any valid distinctions for the Hawaiian fish.

Lycodontis undulata (Lacépède).

Muraenophis undulatus Lacépède: Hist. nat. Poiss., vol. 5, pp. 629, 644, pl. 64, fig. 2, 1803 (no type locality) (on Commerson).

Muraena undulata Günther: Cat. fishes Brit. Mus., vol. 8, p. 110, 1870 (Hawaiian islands.)—Schmeltz: Mus. Godeffroy, Cat. 5. p. 38, 1874 (Samoa; Viti Levu).—Streets: U. S. Nat. Mus., Bull., vol. 7, pp. 77, 1877 (Honolulu).—Boulenger: Ann. Mag. Nat. Hist., 6th ser., vol. 20, p. 374, 1897—(Rotuma).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 228, 1898—(Mariannes).—Steindachner: Akad. Wiss. Wien, Denk., vol 70, p. 515, 1901 (South Sea).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 413, pls. 164-165, 1910 (Hawaiian islands; Society Islands).

Gymnothorax undulatus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 4, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 518, 1902 (1904) (Honolulu; off Molokai).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 98, pl. 16, 1903 (1905) (Honolulu; Samoa).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1423, 1906 (Upolu).—Seale: B. P. Bishop Mus.. Occ. Papers, vol. 4, no. 1, p. 9, 1906 (Tubuai, Austral Islands; Raiatea, Society Islands).—Jordan and Seale: (U.S.) Bur. Fish., Bull., vol. 25, p. 202, 1905 (1906) (Apia; Hawaii).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 21, 1912 (Hawaiian Islands).—Fowler: Copeia, no. 112, p. 82, Nov. 20, 1922 (Hawaii).

Muraena (*Gymnothorax*) *undulata* Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 376, fig. 186, 1916 (Kaimana, New Guinea; Waigiu).

Lycodontis undulata Fowler: B. P. Bishop Mus., Bull. 22, p. 5, 1925 (Guam), p. 31 (Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 7, 1925 (French Frigates Shoal and Wake Island).—Fowler: op. cit., Bull. 38, p. 6, 1927 (Fanning. Tongareva, Howland and French Frigates Shoal).

Muraenophis stellata Lacépède: Hist. nat. Poiss., vol. 5, pp. 629, 644, 1803 (type loc., New Britain).

Gymnothorax stellatus Jordan and Seale: (U.S.) Bur. Fish., Bull., vol. 25, p. 199, 1905 (1906) (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., 26, p. 248, 1911 (Fakarava, Paumotus).

Muraena marmorata Quoy and Gaimard: Voyage "Uranie," Zool., p. 247, 1824 (type loc., Waigiu; Rawak).

Muraenophis lineata Lesson: Voyage "Coquille," Zool., vol. 2, p. 127, pl. 11, fig. 1, 1830 (type loc., Oualan).

Muraena valenciennii Eydoux and Souleyet: Voyage "Bonite," Zool., vol. 1, p. 207, pl. 8, fig. 1, 1841 (type loc., Hawaiian islands).

Muraena tenebrosa Richardson, Voyage "Erebus" and

"Terror," Ichth., p. 84. 1844-48 (no type locality [probably Society Islands]).

Gymnothorax tenebrosus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 7, 1906 (Tahiti).

Muraena acutirostris Abbott: Acad. Nat. Sci. Philadelphia, Proc., p. 476, 1860 (type loc., Hawaiian islands).

Lycodontis acutirostris Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 494, pl. 18, fig. 5, 1900 (type).

Eurymyctera acutirostris Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 105, 1903 (1905) (copied).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 27, 1912 (type).

Thyrsoidea kaupi Abbott: Acad. Nat. Sci. Philadelphia, Proc., p. 477, 1860 (type loc., Hawaiian islands).

Lycodontis kaupi Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 494, pl. 18, fig. 6, 1900 (type).

Gymnothorax kaupi Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 21, 1912 (type).

Gymnothorax blochii Schmeltz: Mus. Godeffroy, Cat. 4, p. 26. 1869 (Savay).

Gymnothorax isingleenoides Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Pelew Islands; Kandavu).—Bleeker: Arch. Neerl. Sci. Nat., vol 13, p. 38, 1878 (New Guinea).

Gymnothorax cancellatus Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Namusi).

Thyrsoidea cancellata Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Samoa).

Muraena cancellata Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 278, 1883 (Hood Bay, New Guinea).

Muraena microspila Schmeltz: Mus. Godeffroy, Cat. 5, p. 38, 1874 (Savay).

Muraena fimbriata Schmeltz: Mus. Godeffroy, Cat. 5, p. 38, 1874 (South Sea).—Günther: Cruise of "Curacoa," p. 410, 1874 (Solomons).—Boulenger: Ann. Mag. Nat. Hist., 6th ser., vol. 20, p. 374, 1897 (Rotuma).—Steindachner: Akad. Wiss. Wein, Denk., vol. 70, p. 514, 1901 (Samoa).

Gymnothorax fimbriatus Steindachner: Akad. Wiss. Wien. Sitz., vol. 115, pt. 1, p. 1423, 1906 (Upolu).

Lycodontis pseudothyrsoidea (non Bleeker) Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 494, 1900 (Hawaiian islands).

Gymnothorax gracilicauda Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 426, fig. 6, 1902 (1903) (type loc., Honolulu).—Snyder: op. cit., vol. 22, p. 518, 1902 (1904) (off Molokai).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 94, fig. 23, 1903 (1905) (types).

Gymnothorax detactus Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 126, 1902 (1903) (type loc., Marcus Island).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 6, 1906 (Nukuhiva, Marquesas Island).

Gymnothorax mucifer Snyder: U. S. Fish Comm., Bull., vol. 22, p. 519, pl. 5, fig. 9, 1902 (1904) (type loc., Honolulu).

Gymnothorax pictus (non Ahl) Seale: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 6, 1902 (1903) (Tahiti).

Gymnothorax nubilus (non Richardson) Seale: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 7, 1902 (1903) (Tahiti).

Gymnothorax zonipectus Seale: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 7, pl. (upper figure), 1902 (1903) (type loc., Tahiti).

Muraena zonipectus Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 45, fig. 1910 [head of Rotuma specimen].

Gymnothorax talofa (Jordan and Starks) Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 201, fig. 7, 1905 (1906) (type loc., Apia).

About 52 specimens in the Bishop Museum, mostly from Honolulu, others from Wake Island, French Frigates Shoal, Tahiti, Nukuhiva, Raiatea, Tubuai, Guam in 1923 and Marcus Island, including the types of *Gymnothorax detactus* and *Gymnothorax zonipectus*. Other specimens were obtained at Palmyra Island in 1913 by C. Montague Cooke, Jr.; Honomuni, Molokai in July 1914 by W. A. Bryan; Mauna Loa Bay, Oahu, in August 1920 by C. H. Edmondson. I also examined 90 fresh specimens of all ages in the Honolulu markets during November and December 1922 and January 1923. Largest specimen 858 mm. In the Wilkes Collection, in the National Museum, I found 2 from Fiji, 1 Hawaiian and 4 without locality, likely from Oceania. Also 19 other Hawaiian specimens, including the types of *Gymnothorax mucifer* and *Gymnothorax gracilicauda*, 6 specimens from Samoa and 1 from Fakarava. In the Agassiz Museum, 3 from Hawaii, 1 from Apia, 1 from Fakarava, 9 from the Society Islands, 2 from Ascension Island, Marshall Islands, and 1 from Apiang, Kingsmill Islands. In the Academy, 3 Hawaiian specimens, including the types of *Muraena acutirostris* Abbott and *Thyrsoidea kaupi* Abbott. Also a Samoan specimen.

Jouan evidently describes this species from Port de France, New Caledonia, as *Muraena* No. 17 (Soc. Cherbourg, Mem., vol. 8, 1861, p. 251). His specimen was 790 mm. with the following color: Gray-yellow, with brown speckling. Streaks of brown somewhat hexagonal. Size of spots increase on tail where forming close-set bands. Longitudinal black streaks accent grooves in throat.

Ranges from East Africa to the East Indies, China, Riu Kiu, Hawaii and Tahiti.

Lycodontis favaginea (Schneider).

Gymnothorax favaginea Schneider: Systema ichth. Bloch, p. 525, pl. 105, 1801 (type loc., Tranquebar).

Muraena (*Gymnothorax*) *favaginea* Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 378, fig. 187, 1916 (Doreh, New Guinea).

Muraena tessellata Richardson: Voyage "Sulphur," Fish., p. 109, pl. 55, figs. 5-8, 1844 (type loc., Southern seas? [locality unknown]).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 38, 1874 (South Sea).

Gymnothorax tessellatus Bleeker: Soc. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).—Waite: Australian Mus., Records, vol. 5, p. 3, 1905 (Paanopu, Ocean Island, Gilbert Group).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 247, 1911 (Rangiroa, Paumotus).

Head, body and fins with large polygonal or rounded black spots, variably separated by narrow white lines or distinct interspaces of ground-color, or all or most of spots wider than interspaces. Length over 1100 mm.

One in the Agassiz Museum, obtained by Andrew Garrett in the Society Islands. One young specimen in the National Museum from Rangiroa.

East Africa to East Indies and Tuamotus.

Lycodontis reevesii (Richardson).

Muraena reevesii Richardson: Zool. voyage "Sulphur," Fishes, p. 109, pl. 48. fig. 2, 1844 (type loc., China Seas).

Thyrsoidea reevesii Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Samoa).

Dark brown, with several series of indistinct black round spots, longitudinally arranged and of about the size of the eye. Head with spots similar to those of body in size and form. Fins without light edge.

Lycodontis chilospila (Bleeker).

Gymnothorax chilospilus Bleeker: Ned. Tijds. Dierk., vol. 2, p. 52, 1865 (type loc., Benkulen; Sumatra; Amboyna; Wahai, Ceram; Kajeli, Buro).

Muraena chilospilus Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 415, 1910 (Tahiti; Rarotonga; Solomons).

Muraena (Gymnothorax) chilospilus Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 379, fig. 188, 1916 (Waigiu).

Gymnothorax detactus (non Bryan and Herre) Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 201, 1905 (1906) (Apia).

Dark-brown streak behind corner of mouth and more or less distinct white spots on jaws, but no white spots on body or tail. Length 330 mm.

In the Agassiz Museum 3 from the Society Islands, obtained by Andrew Garrett. One in the National Museum from Samoa as *Gymnothorax detactus.*

East Indies to Tahiti.

Lycodontis nubila (Richardson).

Muraena nubila Richardson: Voyage "Erebus" and "Terror," Ichth., p. 81, pl. 46, figs. 6-10, 1844-48 (type loc., Australia; Mauritius).—Günther: Cruise of "Curacoa," p. 410, 1873 (Solomon Islands).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 416, 1910 (Norfolk and Raoul islands).

Muraena euptera Günther: Cat. fishes Brit. Mus., vol. 8, p. 122, 1870 (type loc., Raoul Island).

Very close to *Lycodontis chilospila.* Günther describes the color as uniform or irregularly marbled darker, the rictus with a black blotch, which is drawn out in a streak behind and 2 similar dark streaks below. Length 608 mm.

Lycodontis richardsonii (Bleeker) (Pl. II, *D*).

Muraena richardsonii Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 296, 1852 (type loc., Wahai, Ceram; Padang, Sumatra).—Kner: Reise "Novara," Fische, vol. 1, pt. 5, p. 385, 1865 (Tahiti).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 423, 1906 (Savaii).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 414, 1910 (New Lauenburg on Duke of York Island; Samoa; Society Islands; Friendly Islands; Fiji).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., 26, p. 246, 1911 (Bora Bora, Society Islands).

Muraena richardsoni Schmeltz: Mus. Godeffroy, Cat. 5, p. 38, 1874 (Tonga; Rarotonga).—Günther: Rept. voyage "Challenger," vol. 1, p. 58, 1880 (Tahiti).

Gymnothorax richardsoni Weber: Siboga Exped., vol. 65, p. 60, 1913 (Galewo Straits, West New Guinea).

Gymnothorax richardsonii Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 100, 1913 (Saonek).

Muraena (Gymnothorax) richardsoni Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 383, fig. 189, 1916 (Waigiu).

? Muraenophis lineata Lesson: Voyage "Coquille," Poiss., vol. 2, pt. 1, p. 127, pl. 11, fig. 1, 1830 (type loc., Oualan).

Gymnothorax lineatus Jordan and Seale: (U.S.) Bur. Fish., Bull., vol. 25, p. 202, 1905 (1906) (Apia).

? Muraenophis flaveola Lesson: Voyage "Coquille," Poiss., vol. 2, pt. 1, p. 128, pl. 11, fig. 2, 1830 (type loc., Oualan).

Gymnothorax ceramensis Bleeker: Akad. Amsterdam. Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).

Gymnomuraena ceramensis Schmeltz: Mus. Godeffroy, Cat. 4, p. 27, 1869 (Savay).

Gymnothorax hilonis Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 167, 1902 (1903) (type loc., Hilo, Hawaii).—Jordan and Evermann: op. cit., vol. 23. pt. 1, p. 102, pl. 18, 1903 (1905) (type).

Gymnothorax berndti Snyder: U. S. Fish Comm., Bull., vol. 22, p. 518, pl. 4, fig. 8, 1902 (1904) (type loc., Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 98, pl. 15, fig. 2, 1903 (1905) (type).

Head 7 2/5 to 7 3/4; depth 14; snout 4 4/5 to 4 7/8 in head; mouth 2 2/5 to 2 1/2; interorbital 8 1/2; head width 3 1/5 to 3 1/4; eye 2 2/5 to 2 4/5 in snout; gill opening 2 2/5 to 4. Combined head and trunk slightly shorter than tail. Teeth uniserial, compressed, rather slender, in jaws; row of teeth down shaft of vomer, some with 2 canines forward. Rather rich brownish generally, scarcely paler on belly. About 24 to 32 black irregular transverse lines, which may be partly joined or even variously reticulate. Larger specimens show many darker specks or dots on sides of head, becoming more distinct on sides of muzzle, where quite specked. Dark body lines extend on vertical fins, though anal edge narrowly white.

Two in the Bishop Museum from Honolulu, 779 and 944 mm. In the National Museum 3 from Honolulu, including the types of *Gymnothorax hilonis* and *Gymnothorax berndti,* 1 from the Society Islands and 2 from Samoa. In the Agassiz Museum 1 Hawaiian, and 7 Society Islands, of which 1 labeled "Bora Bora."

Ranges from Zanzibar to the East Indies, Hawaii, and Tahiti.

Lycodontis hepatica (Rüppell) (Pl. II, *E*).

Muraena hepatica Rüppell: Atlas Reis. Nord. Afrika, Fisch., p. 120, 1828 (type loc., Red Sea).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 38, 1874 (Savay).

Gymnothorax hepatica Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 375, 1923 (Honolulu).

Gymnothorax albomarginatus Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Savay).

Head 7 3/4 to 8 1/2; depth 13 1/2 to 14 1/2; snout 5 1/2 to 6 1/4 in head; mouth 2 2/3 to 2 3/4; interorbital 7 to 7 2/5; head width 4; eye 2 in snout; tail 2/5, or slightly less, of total length. Teeth in jaws uniserial, laterals compressed, anterior conic; row of conic teeth on vomer, 1 or 2 of which elongated or canine-like anteriorly. Gill opening 1 1/2 in snout. Pores 4 along side of each jaw. Dorsal origin about midway between hind eye edge and gill opening. Color largely more or less uniform dull purplish-brown, often paler on under surface of head and along belly. Vertical fins largely of same tint as back, with conspicuous narrow white edge all around.

Two from Honolulu in the Bishop Museum, 988 and 1369 mm.

Not previously found in Hawaiian waters. Günther gives the Japanese *Muraena albomarginata* Schlegel as a synonym.

Lycodontis micropoecilus (Bleeker).

Muraena micropoecilus Bleeker: Nat. Tijds. Ned. Ind., vol. 8, p. 459, 1855 (type loc., Cocos Islands, Indian Ocean).

Gymnothorax micropoecilus Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).

Muraena (Gymnothorax) micropoecilus Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 387, 1916 (Waigiu; type).

According to Weber and Beaufort a doubtful species. The type, 216 mm. long, is brown, densely spotted with darker and in bad state.

Lycodontis monostigma (Regan).

Muraena monostigma Regan: Ann. Mag. Nat. Hist. London, 8th ser., vol. 4, p. 438, 1909 (type loc., Tahiti; Raiatea).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 409, 1910 (fig. of head [types]).

Agrees with *Lycodontis moluccensis* (Bleeker) in its finely serrated teeth, but differs in the presence of a large blackish blotch close behind the eye. Length 557 mm.

Lycodontis nudivomer (Günther).

Muraena nudivomer Günther: Fish. Zanzibar, p. 127, pl. 18, 1866 (type loc., Zanzibar).—Günther: Cat. fishes Brit. Mus., vol. 8, p. 104, 1870 (type; adult).

Gymnothorax goldsboroughii Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 167, 1902 (1903) (type loc., Honolulu).—Snyder, op. cit., vol. 22, p. 518, 1902 (1904) (Honolulu).—Jordan and Evermann: op cit., vol. 23, pt. 1, p. 100, fig. 26, 1903 (1905) (type).

Muraena goldsboroughii Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 418, 1910 (Hawaiian islands).

Gymnothorax xanthostomus Snyder: U. S. Fish Comm., Bull., vol. 22, p. 519, pl. 5, fig. 10, 1902 (1904) (type loc., Honolulu).

Head 8 1/2 to 9; depth 11 4/5 to 16 1/4; snout 5 in head; mouth 2 to 2 2/5; interorbital 5 3/4 to 6 1/3; head width 2 4/5 to 3; eye 1 1/2 to 2 3/4 in snout. Combined head and trunk slightly less than tail. Although not noticeable in young, adults with uniserial, rather broad, compressed triangular jaw teeth finely serrated. No teeth in any of examples on mouth roof, aside from lateral jaw teeth. Color pattern constant in its fundimental design, though large white spots on tail vary in number, sometimes very numerous, again sparse; mostly quite rounded, again as large irregular or even elongate blotches, which in young specimens resolve into more or less vertical white streaks or bars. In the smaller specimens whitish spots on anterior part of body variably small, but usually large, more crowded and less numerous than in the larger specimens. Gill opening always in a dusky blotch.

In the Bishop Museum, 7 specimens 520 to 1026 mm. from Honolulu. Some interest attaches to the identification of these Hawaiian specimens with Günther's account and figure of Zanzibar material. The serrated teeth, anteriorly biserial jaw teeth in each, toothless vomer and the coloration are in agreement, even in contrast to their great geographical isolation. The types of *Gymnothorax xanthostomus* and *Gymnothorax goldsboroughii,* from Honolulu, in the National Museum.

Fowler and Silvester (Carnegie Inst., Marine Pap., Pub. no. 312, p. 113, 1922), following Günther, wrongly thought *Gymnothorax goldsboroughii* Jordan and Evermann a synonym of *Gymnothorax punctatus* Schneider. Their note of the white fin edge is certainly like the specimens examined by me, though these differ in having the white tail spots formed as vertical series and in the youngest as waved vertical bars, however not without the limits of possible variation for the species.

Enchelynassa canina (Quoy and Gaimard) (Pl. III, *A*).

Muraena canina Quoy and Gaimard: Voyage "Uranie," Zool., p. 247, 1824 (type loc., Waigiu; Rawak).

Enchelynassa canina Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 197, 1905 (1906) (Samoa).

Muraena (Enchelynassa) canina Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 390 figs. 191-192, 1916 (Waigiu).

Enchelynassa bleekeri Kaup: Cat. apodal fish, p. 72, fig. 55, 1856 (no type locality [infers Pacific]).—Jordan and Snyder: U. S. Nat. Mus., Proc., 27, p. 941, 1904 (Hawaiian islands; Samoa).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 90, pl. 10, 1903 (1905) (Honolulu; Samoa).

Muraena bleekeri Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 409, 1910 (Samoa; Tahiti; Raiatea; Hawaii).

Gymnothorax vinolentus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 165, 1902 (1903) (type loc., Kailua).—Jordan and Evermann: op. cit., vol. 23, pt. 1, pl. 11, 1903 (1905).

Enchelynassa vinolentus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 91, 1903 (1905) (type).

Head 7 1/4 to 7 2/5; depth 11 1/5 to 12 3/5; snout 5 2/3 to 5 4/5 in head; mouth from upper jaw tip 2; interorbital 7 1/2 to 8 3/4; eye 2 1/3 to 2 1/2 in snout. Tail slightly less than combined head and trunk. Head width 2 1/4 to 2 1/3 in its total length. Mouth not completely closing, lower jaw protruding in front. Teeth largely uniserial in jaws, large, erect; row of large depressible teeth on each palatine; front of each jaw with 3 large depressible teeth each side, within outer series. Front nostril tubular, near first third in snout. Hind nostril slit large as eye, with broad cutaneous edge. Gill opening slightly larger than eye. Pharynx swollen, much deepest part of body, so long body and tail taper gradually. Dorsal origin elevated, with thick skin all about and begins little before gill opening.

Deep purplish-brown, with numerous obscure vertical waved dusky lines, often broken as shorter bars and nowhere sharply defined or contrasted.

Two in the Bishop Museum from Honolulu, 1089 mm. and 1330 mm. In the National Museum a specimen from Fakarava and the type of *Gymnothorax vinolentus,* obtained August 9, 1901 at Kailua.

The small "darker spots scattered over the body" Jordan and Evermann mention are nowhere evident and the claim for their nominal *Gymnothorax vinolentus* that its body is "marked all over with very small indistinct darker spots so that it appears almost uniform" is hardly substantiated. The markings on no specimen are spots.

East Indies, Hawaii, and Tahiti.

Uropterygius tigrinus (Lesson) (Pl. III, *B*).

Ichthyophis tigrinus Lesson: Soc. Hist. Nat. Paris, Mem., vol. 4, p. 399, 1829 (type loc., Bora Bora, Society Islands).—Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 129, pl. 12, 1830 (Society Islands).

Gymnomuraena tigrina Kner: Reise "Novara," Fische, vol. 1, pt. 5, p. 387, 1865 (Tahiti).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 27, 1869 (Samoa).—Smith and Swain: U. S. Nat. Mus., Proc., p. 121, 1882 (Johnston Island).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 424, 1910 (Society Islands).

Scuticaria tigrina Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 112, pl. 22, 1903 (1905) (Honolulu; Kailua).—Jordan and Seale: (U.S.) Bur. Fish., Bull., vol. 25, p. 206, 1905 (1906) (Apia, Pago Pago).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, pt. 1, p. 11, 1906 (Tahiti, Nukuhiva).

Uropterygius tigrinus Fowler: B. P. Bishop Mus., Bull. 38, p. 7, 1927 (Honolulu).

Gymnomuraena xanthopleura Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Uvea).

? *Gymnomuraena breviceps* Schmeltz: Mus. Godeffroy, Cat. 5, p. 38, 1874 (type loc., Savay). (Nomen nudum.)

Head 12 1/2 to 14; depth 21 1/2 to 22 1/2; tail slightly over a third in total length; snout 5 1/2 to 5 2/3 in head; mouth-cleft 2 2/3 to 2 3/4; interorbital 5 2/3 to 6; head width 2 3/5 to 2 2/3; eye 2 1/2 in snout. In large specimen tubes of posterior nostrils developed nearly large as anterior. Color as usual.

In the Bishop Museum 2 from Honolulu, 1 from Nukuhiva, and 1 from Tahiti; largest 1077 mm. The National Museum has 1 without data, likely from Oceania, obtained by the Wilkes Expedition. Other specimens are 1 from the Hawaiian islands and 1 from Johnston Island. In the Agassiz Museum 11 from the Society Islands and 1 from Apiang in the Kingsmill Islands.

Uropterygius fijiensis Fowler and Bean.

Uropterygius fijiensis Fowler and Bean: U. S. Nat. Mus., Proc., vol. 63, p. 9, 1923 (type loc., Lebukea, Fiji).

Differs from *Uropterygius tigrinus* in the color-pattern. Dark blotches merge on pharynx to form elongate blackish streaks and blotches of dark color on head small. Length 582 mm.

Uropterygius polyspilus (Regan).

Gymnomuraena polyspila Regan: Ann. Mag. Nat. Hist. London, 8th ser., vol. 4, p. 438, 1909 (type loc., Tahiti; Zanzibar).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 425, fig., 1910 (type).

Snout and front half of lower jaw yellow. Body reddish, with large dark spots in 2 or 3 irregular rows on side. Length 178 mm.

In the Agassiz Museum 2 obtained by Garrett in the Society Islands, 204 mm. and 211 mm.

Uropterygius concolor Rüppell.

Uropterygius concolor Rüppell: Neue Wirbelth., Fisch., p. 83, pl. 20, fig. 4, 1835 (type loc., Massaua, Red Sea).—Jordan and Seale: (U.S.) Bur. Fish., Bull., vol. 25, p. 206, 1905 (1906). (Samoa).—Seale, B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 10, 1906 (Nukuhiva, Marquesas Islands).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 250, 1911 (Rangiroa, Paumotus).—Fowler: B. P. Bishop Mus., Bull. 22, p. 5, 1925 (Guam).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 7, 1925 (French Frigates Shoal).—Fowler: op. cit., Bull 38, p. 7, 1927 (Palmyra and Canton islands).

Gymnomuraena concolor Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 426, 1910 (Rotuma; Cape York; Hawaii).—Weber and Beaufort: Fishes Indo-Australian Archipelago. vol. 3, p. 395, 1916 (Humboldt Bay, New Guinea).

Muraena tile (non Buchanan-Hamilton) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 62, 1900 (1901) (Guam).

Uropterygius leucurus Snyder: U. S. Fish Comm., Bull., vol. 22, p. 521, pl. 6, fig. 12, 1902 (1904) (type loc., between Maui and Lanai in 28 fathoms).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 112, pl. 13, fig. 2, 1903 (1905) (type).

Uropterygius marmoratus (non Lacépède) Snyder: U. S. Fish Comm., Bull., vol. 22, p. 521, 1902 (1904) (south of Molokai; between Maui and Lanai).

Anarchias allardicei Jordan and Seale: (U.S.) Bur. Fish., Bull., vol. 25, p. 204, fig. 9, 1905 (1906) (type loc., Pago Pago).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 114, 1922 (Pago Pago).

Muraena allardicei Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 421, 1910 (Society Islands).

Anarchias knighti Jordan and Seale: (U.S.) Bur. Fish., Bull., vol 25, p. 205, fig. 10, 1905 (1906) (type loc., Apia).

This species is uniform brown.

In the Bishop Museum, 2 from Agana, Guam, received from Alvin Seale, June 2, 1900; both have the dorsal developed, but no anal, length 80 and 96 mm.; they also have the belly and lower surface of the head immaculate. One in the Bishop Museum obtained by Thurston and Thaanum in 1922, is 113 mm. It was found at Palmyra Island. Its combined head and trunk 1 1/6 in its tail. One was obtained for the Bishop Museum by C. H. Edmondson on the outer reef of the Cable Station at Fanning, July 28, 1922—anal as low fold to vent and dorsal little more forward, tail longer than combined head and trunk, uniform brown, length 60 mm. Also 2 in the Bishop Museum from Nukuhiva, 95 to 112 mm., 1 from French Frigates Shoal 180 mm., and 2 from Guam in 1923. In the National Museum 2 from Samoa, 1 from Rangiroa and the type of *Uropterygius leucurus*. In the Acamedy one from Pago Pago. One in the Agassiz Museum from Rangiroa, Tuamotus, and 2 obtained by Andrew Garrett in the Society Islands.

It ranges from East Africa to the East Indies, Hawaii, and the Society Islands.

Uropterygius macrocephalus (Bleeker).

Gymnothorax macrocephalus Bleeker: Ned. Tijds. Dierk., vol. 2. p. 54, 1865 (type loc., Amboyna).

Gymnomuraena macrocephalus Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 425, 1910 (Marquesas Islands).

? *Ichthyophis pantherinus* Lesson: Voyage "Coquille," Poiss., vol. 2, pt. 1, p. 131, pl. 13, 1830 (type loc., Oualan, Carolines).

Gymnomuraena pantherina Schmeltz: Mus. Godeffroy, Cat. 4, p. 26, 1869 (Samoa).

Uropterygius pantherinus Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 248, 1911 (Fakarava, Paumotus).

Head 7 3/4 to 9 4/5; depth 16 to 22; snout 5 to 7 1/2 in head; mouth 2 1/2 to 3; interorbital 5 1/3 to 7 2/5; head width 3 to 4 1/6; eye 1 2/5 to 1 4/5 in snout. Combined head and trunk slightly less than tail. Front nostril in short tube, hind one as pore without elevated edge. Brown, paler on belly and lower surface of head, where latter largely whitish. Body rather coarsely mottled or marbled with soiled or darker brownish. Many variable and ill defined spots are formed on some, fre-

quently as 3 or 4 imperfect vertical bands on side of jaws, though not extending across below. Inside mouth pale.

In the Bishop Museum 4 specimens obtained by Thurston and Thaanum in 1922 at Palmyra Island, 123 to 174 mm. in length. They differ from *Uropterygius marmoratus* in eye slightly nearer the rictus than snout tip, less developed dentition and coarser color pattern. One in the National Museum from Fakarava. Two in the Agassiz Museum from Ebon Island.

The species reaches 325 mm. and is distributed from the East Indies to the Marquesas and Tuamotus.

Uropterygius marmoratus (Lacépède).

Gymnomuracna marmorata Lacépède: Hist. nat. Poiss., vol. 5, pp. 648. 649, 1803 (new type loc., New Britain).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 38, 1874 (Uea; Savay).—Boulenger: Ann. Mag. Nat. Hist., 6th ser., vol. 20, p. 374, 1897 (Rotuma).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 425, 1910 (Hawaii).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 3, p. 397, figs. 193-194, 1916 (Waigiu; Tanahmerah, New Guinea).

Uropterygius marmoratus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 111, 1903 (1905) (Kailua).—Jordan and Seale: (U.S.) Bur. Fish., Bull., vol. 25, p. 206, 1905 (1906) (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., 26, p. 250, 1911 (Fakarava and Makemo, Paumotus).—Fowler: Copeia, no. 112, Nov. 20, p. 82, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 5, 1925 (Guam), p. 31 (Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 7, 1925 (French Frigates Shoal).—Fowler: op. cit., Bull. 38, p. 7, 1927 (Christmas and Baker islands).

Scuticaria marmorata Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, pt. 1, p. 12, 1906 (Nukuhiva, Marquesas Islands).

Gymnomuraena micropteryx Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 301, 1868 (Waigiu).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 27, 1869 (Namusi).

Gymnomuraena xanthoptera Schmeltz: Mus. Godeffroy, Cat. 4, p. 27, 1869 (Uvea).

Europterygius xanthopterus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4. no. 1, p. 11, 1906 (Nukuhiva, Marquesas Islands).

Uropterygius macrocephalus (non Bleeker) Jordan and Seale: (U.S.) Bur. Fisher., Bull., vol. 25, p. 206, 1905 (1906) (Apia).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 32, 1912 (Apia).

Head 7 3/5 to 9 1/4; depth 14 to 23; snout 3 1/2 to 7 in head; eye 7 3/4 to 9 1/2; mouth-cleft 1 7/8 to 3 1/10; interorbital 5 1/4 to 9.

Body well compressed, tail tapering rather suddenly at tip. Head compressed, 3 1/2 to 4 to vent; width 3 1/3 to 3 2/5 its length. Snout convex, trifle shorter than wide. Eye nearer rictus than snout tip. Mouth closes, horizontal. Lips rather thick, smooth. Teeth largely conic, sharp pointed; above an outer continuous row of minute erect teeth; before eye depressible conic teeth includes all outer series, more elongate behind; vomer with row of short, wide, erect, conic teeth; laterally behind eye, inner series, close to outer erect teeth, of elongated slender, depressible, conic teeth; mandibular teeth biserial, outer row small, uniform, close-set, erect, inner row elongate, conic, depressible. Jaws even. Front nostril in short fleshy tube near snout tip; hind nostril over eye front, simple pore. Interorbital convex. Gill opening half of eye. Along upper lip 8 pores; pair at snout tip and another pair between nasal tubes. Dorsal fin mere cutaneous fold near tail tip; anal similar; caudal rather angular, tip rounded behind.

Largely deep or dusky-brownish above, paler below and much paler on median ventral region. Head above like back. Mandible pale like belly. Most of upper surface of body obscurely mottled rather finely, with brownish, assuming swarthy appearance on lower surface. Front of mandible and lips somewhat mottled brownish. Iris pale slaty. Rictus and gill opening like adjacent color.

The Academy has 2 from Apia, 1 from Refuge City, Honaunau Bay, Kona, on Hawaii, obtained by H. A. Pilsbry. These 127 to 175 mm. In the Bishop Museum 7 from Nukuhiva, 1 from Guam in 1923 and 1 from French Frigates Shoal, 520 mm. In the National Museum 2 in the Wilkes Collection, of which 1 from Fiji and the other without locality, though likely from Oceania. Other specimens, mostly small, are from Fakarava, Samoa, and Hawaii. Largest specimen 477 mm. In the Agassiz Museum 4 Hawaiian, 1 from Strong Island, Caroline Islands, 1 from Ebon Island, 1 from Apia, and 1 from Fakarava in the Tuamotus.

Widely distributed from Zanzibar to the East Indies, Hawaii, and the Tuamotus.

Uropterygius fasciolatus (Regan).

Gymnomuraena fasciolatus Regan: Ann. Mag. Nat. Hist., 8th ser., vol. 4, p. 438, 1909 (type loc., Duke of York Island).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 426, fig. of head, 1910 (type).

Brownish, with numerous small waved dark cross-bands, some broken or reduced. Length 304 mm.

Uropterygius supraforatus (Regan).

Gymnomuraena supraforatus Regan: Ann. Mag. Nat. Hist. London, 8th ser., vol. 4, p. 439, 1909 (type loc., Savay [Tahiti]).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 426, fig. of head, 1900 (type).

Reddish, with numerous dark spots, posteriorly more or less in cross series and fused together. Length 304 mm.

CHACIDAE

Chaca chaca (Buchanan-Hamilton).

Recorded from New Guinea as *Chaca lophioides* by Kner, in Akad. Wiss. Wien, Sitz., vol. 17, p. 101, pl. 1 figs. 2 to 6?, 1855. Weber and Beaufort state that "this is without question erroneous."

TACHYSURIDAE

Tachysurus sona (Buchanan-Hamilton).

Pimelodus sona Buchanan-Hamilton: Fishes of Ganges, pp. 172, 376, 1822 (type loc., Bengal estuaries).

Arius graeffei Kner and Steindachner: Akad. Wiss. Wien, Sitz., vol. 54, pt. 1, p. 383, fig. 12, 1866 (type loc., Samoan Islands).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 373, fig., 1909 (copied).

Kner says that *Arius graeffei* is near *Arius gagorides* Valenciennes. Though the size of the type is not stated, it is quite likely a moderate or small specimen. In its roughly granular head and spines, and especially the dentition, it approaches *Pimelodus sona* Buchanan-Hamilton.

Tachysurus carinatus (Weber).

Arius (Hemiarius) carinatus Weber: Nova Guinea, vol. 9, pt. 4, p. 537, figs. 13 and 14, 1913 (type loc., Lorentz River at Van Weelskamp and Sande River, New Guinea).

The species listed here from New Guinea are all ably discussed by Weber and Beaufort under *Arius* (Fishes Indo-Australian Archipelago, vol. 2, pp. 272-316, 1913).

Tachysurus nudidens (Weber).

Arius (Hemiarius) nudidens Weber: Nova Guinea, vol. 9, pt. 4, p. 538, fig. 15, 1913 (type loc., Lorentz River at Van Weelskamp, Dutch New Guinea).

Tachysurus spatula (Ramsay and Ogilby).

Arius spatula Ramsay and Ogilby: Linn. Soc. New South Wales, Proc., 2nd ser., vol. 1, p. 15, 1886 (type loc., Strickland River, New Guinea).

Tachysurus latirostris (Macleay).

Arius latirostris Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 277, figs. (head and teeth), 1883 (type loc., Goldie River, British New Guinea).—Weber: Nova Guinea, vol. 9, pt. 4, p. 540, 1913 (Lorentz River at Bivak Island).

Tachysurus dasycephalus (Günther).

Arius dasycephalus Günther: Cat. fishes Brit. Mus., vol. 5, p. 157, 1862 (head and teeth) (type loc., Hawaiian islands).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 373, 1909 (type).

Reported from Hawaii by Günther, though subsequently other writers have contended it may have come from America.

Tachysurus stirlingi (Ogilby).

Arius stirlingi Ogilby: Linn. Soc. New South Wales, Proc., vol. 23, p. 281, 1898 (type loc., estuary of Adelaide River, Northern Territory).—Weber: Nova Guinea, vol. 9, pt. 4, p. 540, figs. 16 and 17, 1913 (Lorentz River, Varen River).

Tachysurus danielsi (Regan).

Arius (Hemiarius) danielsi Regan: Ann. Mag. Nat. Hist. London, 8th ser., vol. 1, p. 154, 1909 (type loc., Fly River, British New Guinea).—Weber: Nova Guinea, vol. 9, pt. 4, p. 542, 1913 (Varen River in Lorentz River basin).

Tachysurus acrocephalus (Weber).

Arius acrocephalus Weber: Nova Guinea, vol. 9, pt. 4, p. 543, figs. 20 and 21, 1913 (type loc., Bibis River, Regen Island, Alkmaar and Lorentz River, New Guinea).

Tachysurus leptaspis (Bleeker).

Hexanematichthys leptaspis Bleeker: Med. Kon. Akad. Wet. Amsterdam, Verslagen, vol. 15, p. 70, 1863 (type loc., southwest New Guinea).—Bleeker: Atlas ichth., vol. 2, p. 27, pl. (17) 65, fig. 2, 1862 (southwest New Guinea).

Arius leptaspis Weber: Nova Guinea, vol. 5, pt. 2, p. 227, 1908 (Moaif River, New Guinea).—Weber: op. cit., vol. 9, pt. 4, p. 544, fig. 22, 1913 (Lorentz River and Bivak Island).—Hase: Jena. Zeitsch. Nat., vol. 51, p. 537, fig. 10, 1914 (dentition) (Sepik, Regenbiwak, Kaiser-Wilhelms Land, New Guinea).

Tachysurus froggatti (Ramsay and Ogilby).

Arius froggatti Ramsay and Ogilby: Linn. Soc. New South Wales, Proc., 2nd ser., vol. 1, p. 14, 1886 (type loc., Strickland River, New Guinea).

Tachysurus armiger (De Vis).

Arius armiger De Vis: Linn. Soc. New South Wales, Proc., vol. 8, p. 454, 1883 (type loc., New Britain).

Head 4 2/3; depth 6 1/2; D. 1, 7; A. 22; P. 1, 8; eye 2 in snout; maxillary barbel reaches beyond pectoral spine, outer mental nearly to its tip; teeth in 2 bipartite divisions, forming curved band and subgranular vomerine in separated elliptical groups, more than third long as wide; palatine teeth in elongate ovate granular group, contiguous to vomerine; occipital process broad as long, sides emarginate and fore end angular, hind end truncate; dorsal buckler moderate, chevron-shaped. Dorsal spine longer than head, front edge subserrate above and granulate below; hind edge strongly toothed. Adipose fin 2/3 of dorsal. Upper caudal lobe longer. Pectoral spine 3/4 of dorsal spine, smooth in front, strongly toothed behind. Ventral 4/5 of pectoral. Paired fins white basally, white for rest. Length 191 mm. (De Vis)

Possibly related to, if not synonymous with, *Tachysurus caelatus* (Valenciennes). According to Weber and Beaufort's account of *T. caelatus*, it would differ in the number of fin rays. The proportions given by De Vis may refer to the total length of the fish.

Netuma thalassina (Rüppell).

Bagrus thalassinus Rüppell: Neue Wirbelth. Fisch., p. 75, pl. 20, fig. 2, 1835 (type loc., Massaua, Red Sea).

Arius thalassinus Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 348, 1876 (off Katow, New Guinea).—Weber: Nova Guinea, vol. 9, pt. 4, p. 536, 1913 (Ostbai).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 2, p. 286, fig. 114, teeth, 1913 (New Guinea).

This well known East Indian species is well distinguished by the three patches of villiform teeth on each side of the palate.

Ranges from East Africa to Australia, Philippines, and New Caledonia.

Tetranesodon conorhynchus Weber.

Tetranesodon conorhynchus Weber: Nova Guinea, vol. 9, pt. 4, p. 546, fig. 24, 1913 (type loc., Lorentz River at Van Weelskamp, New Guinea).

In common with *Nedystoma dayi* and *Hemipimelodus*, without palatine teeth. Patch of few conic teeth each side of jaws and lower gill rakers 8. Gill membranes free behind. Length 210 mm.

Nedystoma dayi (Ramsay and Ogilby).

Hemipimelodus dayi Ramsay and Ogilby: Linn. Soc. New South Wales, Proc., 2nd ser., vol. 1, p. 16, 1886 (type loc., Strickland River, New Guinea).

Nedystoma dayi Weber: Nova Guinea, vol. 9, pt. 4, p. 548, fig. 25, 1913 (Lorentz River, New Guinea).

Differs from *Tetranesodon conorhynchus* and *Hemipimelodus* in the gill membranes totally confluent with the isthmus. Length 240 mm.

Hemipimelodus crassilabris Ramsay and Ogilby.

Hemipimelodus crassilabris Ramsay and Ogilby: Linn. Soc. New South Wales, Proc., ser. 2, vol. 1, p. 18, 1886 (type loc., Strickland River, New Guinea).

The genus *Hemipimelodus* differs from other members of the family in the bands of villiform teeth in the jaws, the short moderate gill rakers and the gill membranes free behind.

The New Guinea species listed here are noticed by Weber and Beaufort (Fishes Indo-Australian Archipelago, vol. 2, pp. 322-329, 1913).

Hemipimelodus macrorhynchus Weber.

Hemipimelodus macrorhynchus Weber: Nova Guinea, vol. 9, pt. 4, p. 549, fig. 27, 1913 (type loc., Lorentz River at Van Weelskamp, Bivak River and Alkmaar).

Hemipimelodus velutinus Weber.

Hemipimelodus velutinus Weber: Nova Guinea, vol. 5, pt. 2, p. 225, 1908 (type loc., Lake Sentani, mouth of Tami and Tawarin rivers, New Guinea).—Weber: op. cit., vol. 9, pt. 4, p. 549, fig. 26, 1913 (Arso River, Bewani River and North New Guinea).

DOIICHTHYIDAE

Doiichthys novae-guineae Weber.

Doiichthys novae-guineae Weber: Nova Guinea, vol. 9, pt. 4, p. 534, fig. 12, 1913 (type loc., Varen River, tributary of Lorentz River, New Guinea).

Differs from Tachysuridae in the gill membranes free from the isthmus and the long anal fin. Length 140 mm.

PLOTOSIDAE

Paraplotosus albilabris (Valenciennes).

Plotosus albilabris Valenciennes: Hist. nat. Poiss., vol. 15, p. 316, 1840 (type loc., Java; Batavia).

Paraplotosus albilabris Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 2, p. 225, 1913 (Sorong, New Guinea).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 96, 1913 (Sorong).

Preanal dendritic organ present. Front nostril perforates upper lip near its front border and faces downward. Length 350 mm.

Plotosus canius Buchanan-Hamilton.

Plotosus canius Buchanan-Hamilton: Fishes of Ganges, pp. 142, 374, 1822 (type loc., rivers of southern Bengal).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 2, p. 227, 1913 (British New Guinea).

Nasal barbel extends beyond eye. Dorsal and anal rays more than 100. Length 900 mm.

Plotosus macrocephalus Valenciennes.

Plotosus macrocephalus Valenciennes: Hist. nat. Poiss., vol. 15, p. 317, pl. 449, 1840 (type loc., Timor).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 592, 1882 (New Guinea).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 1, p. 231, 1913 (type not found in Paris Museum).

A doubtful species, based on a mutilated specimen 456 mm. long.

Plotosus anguillaris (Bloch).

Platystacus anguillaris Bloch: Nat. auslandischen Fische, pt. 8, p. 61, pl. 373, fig. 1, 1794 (no type locality; collection Herr John).

Plotosus anguillaris Günther: Cat. fishes Brit. Mus., vol. 5. p. 24, 1864 (Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 24, 1869 (Kandavu; Pelew Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 276, 1883 (Hood Bay, New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 12, 1906 (Shortland Island, Solomons).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 191, 1905 (1906) (Apia).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 604, 1908 (Suva, Fiji).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 372, 1909 (Solomons; Fiji; Samoa; Tonga; Society Islands; Kingsmills).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 98, 1913 (Saonek and Sorong).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 225, 1915 (Apia).—Fowler: B. P. Bishop Mus., Bull. 22, p. 31, 1925 (Samoa).

Plotoseus ikapor Lesson: Dict. classique hist. nat., vol. 15, p. 435, 1829 (type loc., Offack Bay, Waigiu).

Plotosus ikapor Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 132, pl. 31, fig. 3, 1830 (Offack Bay).

Plotosus lineatus Thiollière: Fauna Woodlark, p. 203, 1857 (Woodlark Island).

Plotosus arab Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 38, 1878 (New Guinea).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1420, 1906 (Apia).

Plotosus canius (non Buchanan-Hamilton) Schmeltz: Mus. Godeffroy, Cat. 4, p. 24, 1869 (Viti Islands).—Schmeltz: op. cit., Cat. 5. p. 35, 1874 (Ovalu).

Plotosus papuensis Weber: Leyden Mus., Notes, vol. 32, pt. 4, p. 228, 1910 (type loc., Lorentz River, New Guinea).—Weber: Nova Guinea, vol. 9, pt. 4, p. 520, fig. 2, 1913 (Lorentz River at Weelskamp, Sabang, Alkmaar, Rivierkamp and Bivak Island).

Arius thalassinus (non Rüppell) Jouan: Soc. Cherbourg, Mem., 3rd ser., vol. 1, p. 334, 1877-78 (on op. cit., vol. 8, p. 305, 1861).

Nasal barbel does not reach beyond the hind edge of the eye. As in *Cnidoglanis* and *Oloplotosus* the front nostril in the front border of the upper lip faces upward and forward.

Three in the Bishop Museum from Shortland Island, 70 to 80 mm. long. Two from New Guinea in the National Museum, 184 to 190 mm. Also 5 in the Wilkes Collection from the Pacific, Tongatabu, and Fiji (?), 70 to 168 mm. The larger with blackish edges to dorsal, anal and caudal and longitudinal pale lines. The 3 smaller show the upper lateral and median lateral whitish longitudinal lines quite distinct, though lower much broader. One in the Academy from Apia.

The description by Jouan of *Silurus* (Soc. Cherbourg, Mem., vol. 8, p. 305, 1861), from Port de France, New Caledonia, pertains to the present species and not to *Netuma thalassina*.

East Africa to the East Indies, Japan, and Society Islands.

Cnidoglanis nudiceps Günther.

Cnidoglanis nudiceps Günther: Rept. voyage "Challenger," vol. 1, p. 49, 1880 (type loc., Arafura Sea).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 2, p. 232, fig. 92, 1913 (type).

Differs from *Plotosus* in the gill membranes united with the isthmus. Teeth conic, besides molars in mandible, and on vomer.

Euristhmus lepturus (Günther).

Cnidoglanis lepturus Günther: Cat. fishes Brit. Mus., vol. 5, p. 28, 1864 (type loc., Sydney, Australia).—Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 347, 1876 (New Guinea).

Differs from *Cnidoglanis* in the gill membranes separated by a wide isthmus, and like in *Plotosus* the axillary pore minute.

Oloplotosus mariae Weber.

Oloplotosus mariae Weber: Nova Guinea, vol. 9, pt. 4, p. 522, fig. 3, 1913 (type loc., Lorentz River at Sabang and Alkmaar, New Guinea).

Differs from *Cnidoglanis*, with which it shares the gill membranes united with the isthmus, in the absence of maxillary and molar teeth. Length over 200 mm.

Porochilus obbesi Weber.

Porochilus obbesi Weber: Nova Guinea, vol. 9, pt. 4, p. 235, fig. 5, 1913 (type loc., Lorentz River at Sabang, New Guinea).

Agrees with *Copidoglanis* in the absence of a preanal dendritic organ, but differs in the front nostril facing downward in the upper lip. Length 120 mm.

Tandanus gjellerupi (Weber).

Copidoglanis gjellerupi Weber: Nova Guinea, vol. 9, pt. 4, p. 528, 1913 (type loc., Kaiserin Augusta River in

central mountain range of Kaiser Wilhelm Land).—Hase: Jena. Zeitsch. Nat., vol. 51, p. 539, 1914 (Sepik, Kaiser-Wilhelms Land [as a new species]).

Copidoglanis papuensis Hase: Jena. Zeitsch. Nat., vol. 51, p. 540, figs. 11, 12, 1914 (same type!).

The species of *Copidoglanis* included here are all treated by Weber and Beaufort in detail (Fishes Indo-Australian Archipelago, vol. 2, pp. 236-245, 1913).

Tandanus equinus (Weber).

Copidoglanis equinus Weber: Nova Guinea, vol. 9, pt. 4, p. 527, fig. 11, 1913 (type loc., Lorentz River at Alkmaar, New Guinea).

Tandanus meraukensis (Weber).

Copidoglanis meraukensis Weber: Nova Guinea, vol. 9, pt. 4, p. 529, 1913 (type loc., Merauke, southern New Guinea).

Tandanus ater (Perugia).

Lambertia ater Perugia: Mus. Genova, Ann., vol. 34, p. 551, 1894 (type loc., Inawi, Makeo district, East New Guinea).

Copidoglanis ater Weber: Nova Guinea, vol. 9, pt. 4, p. 530, 1913 (Lorentz River at Regen Island).

Tandanus brevidorsalis (Günther).

Copidoglanis brevidorsalis Günther: Ann. Mag. Nat. Hist. London, 3rd ser., vol. 20, p. 66, 1867 (type loc., Cape York, Nicol Bay, Australia).—Weber: Nova Guinea, vol. 9, pt. 4, p. 532, 1913 (Lorentz River, Sabang, Alkmaar).

Tandanus bartoni (Regan).

Neosilurus bartoni Regan: Ann. Mag. Nat. Hist., 18th ser., vol. 1, p. 153, 1908 (type loc., Sogeri, British New Guinea).

Tandanus perugiae (Ogilby).

Anyperistius perugiae Ogilby: Queensland Mus., Ann., no. 9, p. 11, 1908 (type loc., Inawe, St. Joseph River, British New Guinea).

Copidoglanis perugiae Weber: Nova Guinea, vol. 9, pt. 4, p. 531, 1907 (note).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 2, p. 243, 1913 (British New Guinea).

Eumeda elongata (non Castelnau) Perugia: Mus. Genova, Ann., vol. 34, p. 52, 1894 (Inawi).

Tandanus novae-guineae (Weber).

Copidoglanis novae-guineae Weber: Nova Guinea, vol. 5, pt. 2, p. 226, 1908 (type loc., Sentani See, North New Guinea).—Regan: Zool. Soc. London, Trans., vol. 20, pt. 6, p. 276, 1914 (Mimika River, New Guinea).

CLARIIDAE

Clarias fuscus (Lacépède).

This species introduced at Guam, reported by Fowler (B. P. Bishop Mus., Bull. 22, p. 5, 1925).

AULOPIDAE

Chlorophthalmus productus Günther.

Chlorophthalmus productus Günther: Rept. voyage "Challenger," vol. 22, p. 193, pl. 50, fig. D, 1887 (type loc., off Matuka, Fiji, in 315 fathoms).

Pectoral about long as head. Adipose fin as far behind dorsal as latter is behind front eye edge. Length 130 mm.

East Indies to Fiji.

Chlorophthalmus proridens Gilbert and Cramer.

Chlorophthalmus proridens Gilbert and Cramer: U. S. Nat. Mus., Proc., vol. 19, p. 406, pl. 36, fig. 2, 1896 (type loc., N. Lat. 21° 8′ to 21° 9′, W. Long. 157° 43′ to 157° 53′ in 298 to 351 fathoms).

Differs from *Chlorophthalmus productus* in the shorter pectoral, which 1 1/5 or more in head. Reaches 178 mm.

Series of specimens examined in the National Museum from Hawaii.

SYNODONTIDAE

Trachinocephalus myops (Schneider) (Pl. III, *C*).

Salmo myops Schneider: Systema ichth., Bloch, p. 421, 1801 (type loc., St. Helena) (on Forster).

Saurus myops Schmeltz: Mus. Godeffroy, Cat. 4, p. 24, 1869 (Viti Islands).—Vaillant: Soc. Philom. Paris, Bull., 7th ser., vol. 11, p. 53, 1886-87 (Tahiti).—Ishikawa: Prelim. cat. fishes Japan, p. 22, 1897 (Bonin Islands).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 375, 1909 (Fiji).

Trachinocephalus myops Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 433, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 521, 1902 (1904) (Honolulu; Hanalei Bay; Kauai).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 62, fig. 13, 1903 (1905) (Hilo; Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 5, 1906 (Shortland Island, Solomons).—Fowler: B. P. Bishop Mus., Bull. 22, p. 23, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 7, 1925 (Lahaina, Maui).—Whitley: Australian Mus., Records, vol. 15, no. 5, p. 290, 1927 (New Hebrides).

Saurus limbatus Eydoux and Souleyet: Voyage "Bonite," Zool., vol. 1, p. 199, pl. 7, fig. 3, 1841 (no type locality).

Trachinocephalus limbatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 17, 1902 (Honolulu).

Head 3 1/4 to 3 2/5; depth 4 7/8 to 6 3/5; D. II, II, 1, once II, 10, 1; A. 1, 14, 1; scales 53 to 57 in lateral line to caudal base and 3 or 4 more on latter; 4 scales above lateral line, 6 or 7 below; 17 predorsal scales; snout 5 1/2 to 7 1/2 in head measured from upper jaw tip; eye 4 1/6 to 6 1/2; maxillary 1 2/3 to 2; interorbital 6 1/4 to 11 1/2. Gill rakers small and rather irregular points, bases about 13+15. Scales with 3 basal radiating striae. Faded brownish, with 5 or 6 lines longitudinally on back, some waved, broken little and as specks on head above. Brown scapular blotch. Fins pale. Length 45 to 215 mm.

Eleven in the Bishop Museum from Honolulu and 2 from Lahaina, Maui. Three adults in the Agassiz Museum, Hawaiian, from Dr. C. F. Winslow. Seven Hawaiian specimens in the National Museum. I found a single specimen in the Honolulu market December 29, 1922.

The species is circumtropical, and is found throughout Oceania.

Synodus intermedius (Agassiz).

Saurus intermedius (Spix) Agassiz: Pisc. Brazil., p. 81, pl. 44, 1829 (type loc., Brazil).—Günther: Rept. voyage "Challenger," vol. 1, p. 50, 1880 (Arafura Sea).

Scales larger than in *S. japonicus* and *S. kaianus*, 48 to 52 in lateral line, also fewer transversely. Length 380 mm.

Western tropical Atlantic and Arafura Sea.

Synodus japonicus (Houttuyn) (fig. 12).

Cobitis japonicus Houttuyn: Hollandsche Maatsch. Wet. Haarlem, Verh., vol. 20, p. 337, 1782 (type loc., Japan).

Synodus japonicus Fowler: Copeia, no. 112, p. 82, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 4, 23, 1925 (Guam, Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 7, 1925 (French Frigates Shoal).—Fowler: op. cit., Bull. 38,

p. 7, 1927 (Pearl and Hermes Reef, Midway Island, Honolulu).

Saurus variegatus Quoy and Gaimard: Voyage "Uranie," Zool., p. 223, pl. 48, fig. 3, 1824 (type loc., Mauritius; Maui).

Synodus variegatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 63, 1900 (1901) (Guam).—Seale: op. cit., vol. 1, no. 5, pp. 15, 16, 20, 1902 (Hilo, Honolulu).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 101, 1913 (Saonek).

Saurus synodus (non Linné) Valenciennes: Hist. nat. Poiss., vol. 22, p. 354, 1849 (New Guinea).—Thiollière: Fauna Woodlark, p. 204, 1857 (Woodlark Island).—Bleeker: Soc. Ind. Neerl., Act. no. 2, vol. 6, pp. 3, 5, 1859 (Doreh, New Guinea).

Synodus synodus Bleeker: Atlas ichth., vol. 6, p. 154, pl. (11) 278, fig. 5, 1866-72 (New Guinea).

Saurus mormoririk (Montrouzier) Thiollière: Fauna Woodlark, p. 204, 1857 (name in synonymy).

Saurus varius Schmeltz: Mus. Godeffroy, Cat. 4, p. 24, 1869 (Samoa; Viti Islands).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 35, 1874 (Tahiti).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 592, 1882 (New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 375, 1909 (Hawaii; Pelew Islands; Fiji; Society Islands; Paumotu; Samoa; Tahiti).

Synodus varius Günther: Rept. voyage "Challenger," vol. 1, p. 36, 1880 (Ovalau; Fiji).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 513, 1901 (Honolulu; Laysan).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 433, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 521, 1902 (1904) (Honolulu).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 28, p. 125, 1904 (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 63, pl. 2, fig. 14, 1903 (1905) (Hilo; Honolulu).—Gilbert: op. cit., vol. 23, pt. 2, p. 588, 1903 (1905) (off Molokai; Avau Channel; Bird Island; 20 to 73 fathoms).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 5, 1906 (Mangareva, Gambier Islands).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 188, 1905 (1906) (Samoa).

Trachinocephalus myops (non Schneider) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 5, 1906 (Rarotonga, Cook Islands; part).

Synodus dermatogenys Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 566, fig. 3, 1911 (1912) (type loc., Hawaiian islands).

Head 3 1/8 to 3 3/5; depth 6 to 8; D. II or III, 10, I to 12, I; A. II to IV, 5, I to 7, I, abnormally IX, I; scales 55 to 60 in lateral line to caudal base and 3 or 4 more on latter; 5 or 6 scales above lateral line, 6 or 7 below; 19 to 22 predorsal scales; snout 4 to 5 in head measured from upper jaw tip; eye 5 1/5 to 8; maxillary 1 1/2 to 1 3/5; interorbital 5 7/8 to 8 1/2. Gill rakers 14 to 34 low asperous knobs. Scales with 3 or 4 basal radiating striae, edges scalloped. Length 30 to 266 mm.

In the Bishop Museum, 34 specimens from Honolulu, Hilo, Laysan, French Frigates Shoal, Guam, Rarotonga, Mangareva, Faté and Shortland islands. I examined over 100 fresh specimens in the Honolulu market, both green and red phases. In the Agassiz Museum are 7 Hawaiian specimens, one from the Society Islands obtained by Garrett and 1 from Ebon Island from Snow. A series of Hawaiian specimens in the National Museum, of which one from Wilkes, who also obtained 3 from Fiji. No. 1980 in the Bishop Museum, reported as *Trachinocephalus myops* by Seale, from Rarotonga, is the present species. It shows the usual transverse dark bands, 10 in number, alternately darker and lighter. The types of *Synodus dermatogenys* in the Academy are 5 in number. The type and 2 of the paratypes represent the red phase, while the others are greenish. None shows the large scale on the lower cheek as in Jordan and Evermann's figure. The cheek below shows little or no indication of scales in most these specimens and on most of those which do, the scales are smaller than those median or above. The red specimens show a slightly larger eye and shorter ventrals.

Noticed as *Osmerus* No. 87 by Jouan (Soc. Cherbourg, Mem., vol. 8, p. 300, 1861), from Port de France, New Caledonia. It is noticed as follows: D. 13; A. 16. Upper jaw little longer. Lateral line straight. Caudal forked. Adipose fin very small. Ventral before first dorsal. Reddish-fawn, translucent. Length 250 mm.

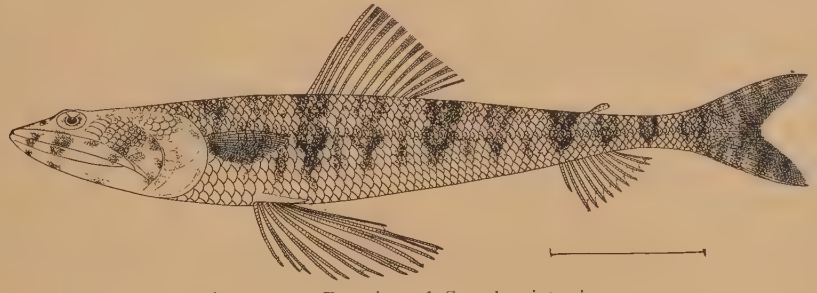

FIGURE 12.—Drawing of *Synodus japonicus*.

Widely distributed from the Red Sea and Zanzibar to the East Indies, Japan, Hawaii and Tahiti.

Synodus kaianus (Günther).

Saurus kaianus Günther: Rept. voyage "Challenger," vol. 1, p. 50, pl. 23, fig. C, 1880 (type loc., Ki Islands in 129 fathoms).

Synodus kaianus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 588, 1903 (1905) (Pailolo Channel off northern Maui in 122 to 178 fathoms).

Differs from *S. japonica* in but 17 predorsal scales and the pectorals reaching the twelfth scale in the lateral line. Length 140 mm.

East Indies to Hawaii.

Saurida gracilis (Quoy and Gaimard).

Saurus gracilis Quoy and Gaimard: Voyage "Uranie," Zool., p. 224, 1824 (type loc., Hawaiian islands; Mauritius).

Saurida gracilis Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 433, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 521, 1902 (1904) (Hanalei Bay, Kauai).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 65, 1903 (1905) (Hilo; Honolulu).—Gilbert: op. cit., vol. 23, pt. 2, p. 589, 1903 (1905) (off northern Maui in 14 to 18 fathoms).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 5, 1906 (Shortland Island, Solomons).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 189, 1905 (1906) (Apia).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 376, 1910 (Solomon Islands; Fiji; Society Islands; Hawaii).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 509, 1911 (1912) (types of *Synodus sharpi;* Hawaiian islands; Hilo).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 244, 1911 (Makemo, Paumoto; Truk Group, Carolines).—Fowler: Copeia, no. 112, p. 82, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 4, 1925 (Guam).

Saurida nebulosa Valenciennes: Hist. nat. Poiss., vol. 22, p. 374 (504), pl. 648, 1849 (type loc., Mauritius; New Guinea; Timor; Tahiti).—Bleeker: Atlas ichth., vol. 6, p. 156, pl. (1) 277, fig. 1, 1866-72 (New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 24, 1868 (Uvea).—Schmeltz: op. cit., Cat. 5, p. 35, 1874 (Uea; Rarotonga).—Streets: U. S. Nat. Mus., Bull., vol. 7, p. 6, 1877 (Honolulu).—Bleeker: Arch. Neerl Sci. Nat., vol. 13, p. 38, 1878 (New Guinea).

Dentex nebulosa (Solander) Valenciennes: Hist. nat. Poiss., vol. 22, p. 375, 1849 (type loc., Tahiti).

Synodus sharpi Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 497, pl. 19, fig. 2, 1900 (Hawaiian islands).

Saurida tumbil (non Bloch) Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 498, 1900 (Hawaiian islands).

Synodus varius (non Lacépède) Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 63 (65), 1903 (1905) (part).

Head 4 to 4 1/5; depth 6 to 7 2/3; D. 11, 9, 1; A. IV, 7, 1 or 8, 1; scales 44 to 48 in lateral line to caudal base and 4 more on latter; 4 scales above lateral line, 5 or 6 below; 18 predorsal; snout 4 1/4 to 4 1/3 in head; eye 5 to 5 1/6; maxillary 1 1/2 to 1 3/5; interorbital 4 2/3 to 6. Gill rakers 30 + 50, fine denticles, barely 1/3 of gill filaments, which 1/2 of eye. Scales with 2 or 3 basal radiating striae, edge scalloped. Saddles on back irregular, 4 or 5 darker, with at least pair of intermediate paler bands in each interspace.

In the Bishop Museum 14 specimens from Honolulu, Shortland Island, and 1 from Guam in 1923. Largest 224 mm. I examined 125 specimens in the Honolulu markets in November and December 1922. The National Museum has 8 Hawaiian and 2 Samoan specimens obtained by the Wilkes Expedition. Also 6 other Hawaiian, 1 from Makemo, and 2 Samoan specimens. Largest 278 mm. In the Agassiz Museum 11 Hawaiian specimens, 3 from Truck, and 1 from the Society Islands obtained by Andrew Garrett. The Academy has 4 from Hilo and 5 other Hawaiian specimens, of which 3 are types of *Synodus sharpi.*

Jouan describes *Osmerus* No. 88 (Soc. Cherbourg, Mem., vol. 8, p. 300, 1861) from reefs of Port de France, New Caledonia. It is not certainly distinct from *Synodus japonicus,* according to the imperfect account: D. 11; A. 9. Teeth numerous on palatines and tongue. Head and body above gray-brown with black blotches, below white. Length 150 mm.

Widely distributed from East Africa and Mauritius to the East Indies, Hawaii, and Tahiti.

Saurida tumbil (Bloch).

Salmo tumbil Bloch: Nat. auslandischen Fische, pt. 9, p. 112, pl. 430, 1795 (no type locality; collection Herr John).

Saurida tombil Valenciennes: Hist. nat. Poiss., vol. 22, p. 371, 1849 (Vanicolo; Waigiu).

Saurida tumbil Bleeker: Atlas ichth., vol. 6, p. 155, pl. (1) 277, fig. 4, 1866-72 (Waigiu).—Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 348, 1876 (New Guinea).

Agrees with *Saurida gracilis* in the pectorals shorter than the postorbital region or reaching ninth or tenth scales of lateral line, which has more scales, or 54 to 63. Length 420 mm.

Zanzibar to the East Indies, Japan, Vanicolo. The species has not yet been obtained in Hawaii.

Saurida grandisquamis Günther.

Saurida grandisquamis Günther: Cat. fishes Brit. Mus., vol. 5, p. 400, 1864 (type loc., Louisiade Islands and Australia?).—Günther: Rept. voyage "Challenger," vol. 1, p. 50, 1880 (Arafura Sea).

D. 12 or 13. Pectorals somewhat shorter than head without snout, reach twelfth scale in lateral line, which has 49 or 50 scales. Length over 260 mm.

Malacca, East Indies, Australia, Louisiades.

Bathysaurus mollis Günther.

Bathysaurus mollis Günther: Ann. Mag. Nat. Hist., 5th ser., vol. 2, p. 182, 1878 (type loc., middle of South Pacific; off Yeddo; in 1875 to 2385 fathoms).

D. 15; A. 11; snout broad, depressed; teeth barbed, fang-like. Length 482 mm.

Bathypelagic.

PARALEPIDAE

Lestidium nudum Gilbert.

Lestidium nudum Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 607, fig. 236, 1903 (1905) (type loc., Pailolo Channel between Molokai and Maui in 283 or 284 fathoms).

Body naked, except row of imbedded concealed scales in course of lateral line. Length 200 mm.

Neosudis vorax Castelnau.

Neosudis vorax Castelnau: Zool. Acclimat. Soc. Victoria, Proc., vol. 2, p. 118, 1873 (type loc., Noumea, New Caledonia).

Head 6 1/3 in total; depth 8 1/2; D. 16; A. 26. Body very long, compressed, sharp below; eye 4 2/3 in head, with adipose membrane; lower jaw longer; maxillary extends beyond eye; teeth strong, slender, almost straight and upper shorter, except 2 larger projecting obliquely forward. Scales minute. Dorsal at 2/3 in body length; anal inserted little behind dorsal origin; caudal deeply forked; pectoral low, 2/3 of head; ventral very small. Silvery; dark slaty above; dorsal, anal and ventral white; caudal rather yellow, bordered with black. Length 608 mm. (Castelnau)

BATHYPTEROIDAE

Bathypterois longifilis Günther.

Bathypterois longifilis Günther: Ann. Mag. Nat. Hist., 5th ser., vol. 2, p. 183, 1878 (type loc., near Kermadec Islands, in 520 and 620 fathoms).

Bathypterois longicauda Günther: Ann. Mag. Nat. Hist., 5th ser., vol. 2, p. 184, 1878 (type loc., middle of South Pacific in 2550 fathoms).

Bathypterois antennatus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 590, fig. 235, 1903 (1905) (type loc., near Bird Island in 313 to 800 fathoms; near Kauai in 1000 to 1314 fathoms).

The species *Bathypterois longifilis* Günther was based on a specimen 320 mm. long. Günther admits that his *Bathypterois longicauda,* based on a specimen 76 mm. shows characters of youth. Gilbert has given no distinctions for his intermediate specimens, 165 to 200 mm. long, of the nominal *Bathypterois antennatus.* All would show a range in the dorsal rays as only 12 to 15 and the pectoral 2 or 3, 9 to 13, the scales 55 to 61, hardly appearing sufficient for specific distinctions. Jordan and Seale call this genus *Brachypterois* ([U. S.] Bur. Fish., Bull., vol. 25, p. 189, 1905 [1906]).

MYCTOPHIDAE

Centrobranchus choerocephalus Fowler.

Centrobranchus choerocephalus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 754, 1903 (type loc., Hawaiian islands).—Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 594, pl. 69, fig. 1, 1903 (1905) (south of Oahu; off Niihau; French Frigates Shoal; Laysan; east of Kauai; between Honolulu and San Francisco).—Gilbert: Mus. Comp. Zool., Mem., vol. 26, no. 6, p. 224, 1908 (S. Lat. 16° 39′, W. Long. 149° 11′).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 570, 1911 (1912) (types).—Fowler: Copeia, no. 112, p. 82, Nov. 20, 1922 (Hawaii).

Myctophum coruscans (non Richardson) Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 498, 1899 (on above).

Rhinoscopelus oceanicus (part) Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 168, 1902 (1903) (copied).

Type and 5 paratypes in the Academy, received from W. H. Jones. In the National Museum 36 Hawaiian specimens.

Centrobranchus andrae (Lütken).

Scopelus (Rhinoscopelus) andrae Lütken: Kon. Dansk. Vid. Selskab Skrift, Kjöbenhavn, 6th ser., vol. 7, p. 245, fig. 3, 1892 (type loc., N. Lat. 4° to 4°, W. Long. 12° to 78°; S. Lat. 4° to 33°, W. Long. 11° to 28°; S. Lat. 5° to 38°, E. Long. 12° to 112°; Bengal Bay).

Centrobranchus gracilicaudus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 595, pl. 69, fig. 2, 1903 (1905) (type loc., west of Niihau; west of Oahu; southwest of French Frigates Shoal; near Laysan).

Differs from *Centrobranchus choerocephalus* in the supraanal photophores in but slightly oblique series from vertical, with median spot vertically opposite vent, lowest above fourth spot of the ventral series. Length 33 mm.

Three Hawaiian specimens in the National Museum.

Dasycopelus asper (Richardson).

Myctophum asperum Richardson: Voyage "Erebus" and "Terror," Ichth., p. 41, pl. 27, figs. 13 to 15, 1844-48 (type loc. unknown).

Dasyscopelus asper Gilbert: Mus. Comp. Zool., Mem., vol. 26, no. 6, p. 221, 1908 (N. Lat. 3° 28′, W. Long. 136° 54′, about 700 miles north of Marquesas Islands).

Scopelus asper Günther: Cat. fishes Brit. Mus., vol. 5, p. 411, 1864 (New Ireland given as locality).

Dasyscopelus pristilepis Gilbert and Cramer: U. S. Nat. Mus., Proc., vol. 19, p. 412, pl. 39, fig. 1, 1896 (type loc., N. Lat. 21° 15′ 49″, W. Long. 157° 44′ 27″).—Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 600, 1905 (1906) (off Lanai; Molokai; Oahu; south of Bird Island; French Frigates Shoal; Laysan; Kauai).—Gilbert: Mus. Comp. Zool., Mem., vol. 26, no. 6, p. 220, 1908 (N. Lat. 1° 45′, W. Long. 137° 36′; S. Lat. 16° 39′, W. Long. 149° 11′).

Myctophum pristilepis Gilbert: Mus. Comp. Zool., Bull. 46, no. 14, p. 259, pl. 3, 1906 (Hawaii).

Gilbert first says (1905) "*Dasyscopelus asper* differs from *Dasyscopelus pristilepis* in the presence of a large preocular photophore, extending from middle of eye forward to around nostrils; furthermore, the anal spots are 10 + 4, and the 2 caudal photophores are widely separated." The original figure by Gilbert and Cramer shows but 8+4 anals. Finally Gilbert says *Myctophum pristilepis* "differs from *Myctophum asperum* Richardson, according to the original description and figure, in the larger eye, shorter snout, the fewer anal photophores, and in the relative position of the supraanals and the precaudals, the former being strongly angulated and the latter widely separated in *Myctophum asperum.*"

The range of variation given for *Dasyscopelus pristilepis* by Gilbert, of the anal photophores is 6 to 8 + 3 to 5. The only point of difference apparent for *Myctophum asperum* would therefore be one more photophore in the posterior section.

Forty-three specimens, from Hawaii, in the National Museum.

The imperfectly described *Scopelus stellatus* Bennett, described from Lat. S. 40° in the Pacific may refer to *Dasycopelus asper* (Whaling voyage, vol. 2, 1840, p. 288, fig.):

Body compressed. Head large, blunt. Eyes large; iris silvery. Mouth capacious; lower jaw protrudes. Both jaws with teeth. Branchiostegals 8. Scales large, compact, metallic white. Scales in lateral line larger and more prominent than others. Row of photophores along lower side of body. Dorsal placed near center of back; rays 23. Adipose fin present. Pectoral comparatively long, slender and curved. Ventral rays 13. Length 76 mm.

Wide distribution in the Atlantic, Indian and Pacific Oceans.

Dasyscopelus spinosus (Steindachner).

Scopelus spinosus Steindachner: Akad. Wiss. Wien, Sitz., vol. 55, p. 711, pl. 3, figs. 4-a, 1867 (type loc., China).—Lütken: Kon. Dansk. Vid. Selsk. Skrift., 2nd ser., vol. 7, p. 239, pl. 1, figs. 1-2, 1890-94 (1892) (Sydhavet, Maldon Island, 4° S. Lat. from Hawaiian Group).

Dasyscopelus spinosus Gilbert: Mus. Comp. Zool., Mem., vol. 26, no. 6, p. 220, 1908 (N. Lat. 3° to 16°, W. Long. 135° to 149°).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 7, 1925 (Wake Island).

Head 3 1/4 to 3 1/2; depth 3 2/3 to 4 1/8; D. iv, 10, 1; A. iii, 16, 1; scales 36 in lateral line to caudal base and 2 more on latter; 4 scales above lateral line, 5 below; 12 predorsal scales; snout 4 to 4 2/3 in head; eye 2 1/4 to 2 3/4; maxillary 1 1/3 to 1 1/2; interorbital 4 to 4 1/2.

Body well compressed, elongately oviate, deepest at dorsal origin, edges rounded. Least depth of caudal peduncle 2 1/3 to 2 2/5 in its length or 3 2/3 to 4 in head.

Head width 1 4/5 to 2 3/4 in its length. Snout very obtuse, length 1 3/4 to 2 in its width. Eye large, hind edge midway in head length. Mouth large, lower jaw scarcely projecting; lower jaw little shorter than upper

in young. Maxillary reaches slightly beyond hind eye edge; expansion 3 1/2 to 3 3/4 in eye. Teeth in finely asperous bands in jaws, on vomer and palatines. Nostrils close together, before middle of eye; hind nostril short vertical slit, twice size of front one. Interorbital level. Gill rakers 6 + 16, lanceolate, 1/3 longer than gill filaments, 2 in eye.

Scales with basal edge trilobate, as 3 to 5 obscure radiating striae; apical denticles 36 to 38; circuli moderate. Scales firmly adherent, spinous, especially spinescent along bases of vertical fins. Lateral line median laterally. Mandibular photophores 3 pairs; 1 behind lower preopercular edge close above hind maxillary edge; pectorals 3; thoracic 5; ventrals 4; anal 7 + 7, vary 9 + 5 to 6 + 7; caudals 2; anterolateral 1; mediolaterals 3, in same plane; posterolateral 1. Supracaudal luminous plates 5, all rather large; on some 3 luminous plates on lower surface of caudal peduncle anteriorly. First branched dorsal ray 1 1/4 to 1 1/2 in head; first branched anal ray 1 2/3; caudal well forked, 1 1/4 to 1 1/3; pectoral 1 to 1 1/10, reaches far as ventral tip, little beyond in young; ventral 2 to 2 1/3.

Back violet, side and below dark with shining bright silvery reflections. Iris silvery-white. Fins grayish, darker or dusky-gray on front rays of dorsal and anal and upper and lower caudal lobes. Pectoral and ventral pale, medianly dark gray. Photophores small, yellowish, on black areas, those on upper surface of caudal peduncle all bright yellowish. Length 38 to 126 mm.

In the Bishop Museum 4 from Wake Island in July 1923. In the National Museum 31 Hawaiian specimens.

Like *D. asper* this species has ctenoid scales. It differs in the 3 evenly oblique supra-anal photophores, these forming a blunt angle in *D. asperus*.

East Atlantic, Indian and West Pacific Oceans.

Diaphus nanus Gilbert.

Diaphus nanus Gilbert: Mus. Comp. Zool., Mem., vol. 26, no. 6, p. 224, pl. 1, 1908 (type loc., near Nukuhiva, Marquesas Islands, to 300 fathoms).

Upper preorbitals on front of snout directed forwards like headlights, occupying each a roundish depression above nostril; lower preorbital widely separated from upper on lower border of orbit; preopercular border nearly vertical; accessory gland developed in connection with suprapectoral only.

Two cotypes in the National Museum from the Marquesas Islands.

Marquesas Islands to Japan.

Diaphus agassizi Gilbert.

Diaphus agassizi Gilbert: Mus. Comp. Zool., Mem., vol. 26, no. 6, p. 226, pl. 2, 1908 (type loc., Nukuhiva, Marquesas Islands, to 300 fathoms).

Preorbital photophore confined to a single minute dot above the nostril; upper supra-anal and posterolateral immediately below lateral line.

Marquesas Islands to Japan.

Diaphus signatus Gilbert.

Diaphus signatus Gilbert: Mus. Comp. Zool., Mem., vol. 26, no. 6, p. 228, pl. 3, 1908 (type loc., near Nukuhiva, Marquesas Islands).

Closely allied with *Diaphus splendidus* (Brauer).

Diaphus dumerili (Bleeker).

Scopelus dumerili Bleeker: Soc. Ind. Neerl., Act., (Manado), vol. 1, p. 66, 1856 (type loc., Manado, Celebes).

Diaphus urolampus Gilbert and Cramer: U. S. Nat. Mus., Proc., p. 408, pl. 38, fig. 1, 1896 (type loc., N. Lat. 21° 13′ to 21° 12′, W. Long. 157° 43′ 37″ to 157° 49′ in 295 to 310 fathoms).

Preorbital luminous body small, and a small suborbital one below the front half of the eye. In this genus the photophores divided by a black septum.

One Hawaiian specimen in the National Museum.

Bathypelagic in the tropical Atlantic, Indian and Pacific Oceans.

Diaphus adenomus Gilbert.

Diaphus adenomus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 592, pl. 68, fig. 1, 1903 (1905) (type loc., Kaiwi Channel between Oahu and Molokai in 335 to 350 fathoms; off south Oahu in 265 to 280 fathoms; near Kauai in 318 to 362 fathoms).

Differs from *Diaphus dumerili* in a narrow luminous streak above the eye and one below it. Possibly not distinct from *Diaphus caeruleus* (Klunzinger).

Specimen from Hawaii in the National Museum.

Diaphus chrysorhynchus Gilbert and Cramer.

Diaphus chrysorhynchus Gilbert and Cramer: U. S. Nat. Mus., Proc., vol. 19, p. 409, pl. 38, fig. 3 (non 2), 1897 (type loc., N. Lat. 21° 15′ 49″, W. Long. 157° 27″; Iiao Makauni).—Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 592, 1905 (1906) (off Kaunakakai; Honolulu; northwest Oahu; 235 to 282 fathoms).

Luminous area entirely covers snout.

The species *Myctophum* (*Nyctophus*) *elucens* Brauer from the Western Indian Ocean is closely related.

Lampanyctus townsendi Eigenmann and Eigenmann.

Lampanyctus townsendi Eigenmann and Eigenmann: West American Scientist, p. 125, 1889 (type loc., Cortez Banks near San Diego, California).—Gilbert: Mus. Comp. Zool., Mem., vol. 26, no. 6, p. 230, pl. 4, 1908 (Ua Huka Island, Marquesas Islands, to 300 fathoms).

Luminous scales not confined to precaudal region. Supra-anals in an oblique row; 1 above pectoral base. Dorsal and anal short, about equal.

California, Marquesas Islands, and Japan.

Lampanyctus niger (Günther).

Nannobrachium nigrum Günther: Rept. voyage "Challenger," vol. 22, p. 199, pl. 52, fig. 3, 1887 (type loc., south of Philippines in 500 fathoms).—Gilbert: U. S. Fish Comm., Bull., vol. 23. pt. 2, p. 591, 1903 (1905) (Kaiwi Channel, in 411 to 460 fathoms).

Lampanyctus niger Gilbert: Carnegie Mus., Mem., vol. 6, no. 2, p. 100, 1913 (note on Hawaiian specimens).

Luminous scales confined to precaudal patches or with 1 in addition in front of adipose fin; supra-anals angulated. Pectorals short, not reaching ventrals.

East Indies to Hawaii and Japan.

Lampanyctus omostigma Gilbert.

Lampanyctus omostigma Gilbert: Mus. Comp. Zool., Mem., vol. 26, no. 6, p. 232, pl. 5, 1908 (type loc., N. Lat. 10° 57′ 35″, W. Long. 137° 35′ 25″, about 1000 miles north of Marquesas Islands).

Nyctimaster reinhardti Jordan: U S. Nat. Mus., Proc., vol. 59, p. 645. fig. 2, 1921 (type loc., Kau, Hawaii).

Head 3 1/10; depth 6 1/2; D. III, 11, 1; A. III, 12, 1; scales in lateral line enlarged, very caducous, according to pockets about 36 to caudal base; head width about 2 3/4 in its length; mandible 1 1/3; snout 5 1/2 in

head measured from upper jaw tip; eye 4 4/5; maxillary 1 2/5; interorbital 4 4/5.

Body elongate, well compressed, slopes back to rather slender caudal peduncle. Head attenuated, well compressed. Snout conic, length about half its width. Eye large, little longer than snout, hind edge about first 2/5 in head. Mouth very large, mandible slightly protrudes. Bands of fine even teeth in jaws, on vomer and palatines; vomerine in 2 patches and each patch biserial; palatines as 2 very long broad bands, outer slightly more than half entire mouth gape; inner palatine band much broader and very little shorter; moderate band of teeth on each pterygoid. Interorbital depressed, rather cavernous.

Gill opening very large, deeply cleft, extends forward at least to front eye edge. Gill rakers 4 + 10, very lanceolate, equal eye; gill filaments about 1/4 of gill rakers.

Scales nearly all fallen, few remaining very thin and papery; along lateral line decidedly larger than those adjacent, at least about front of dorsal and anal where some still remain. Triangular luminous blotch behind eye indistinct, about 3/5 of eye. Tubes in lateral line simple.

Most fins with ends damaged, though dorsal with anterior rays little shorter, when depressed, than tips of posterior rays; first branched ray about 1 3/4 in total head length. Anal begins slightly before bases of last 3 or 4 dorsal rays; fourth branched ray 2 2/3 in head. Pectoral and ventral damaged, so only posterior parts of rays basally remain, though latter apparently would reach well beyond front of anal.

Dusky to blackish, with brownish shades. Fins pale or whitish. Length 93 mm. (caudal damaged).

The specimen here described in the Bishop Museum, from Alika, Kau District, Hawaii. October 1919. T. Reinhardt. Also the type and another cotype, both dry, in the National Museum, same data. Closely allied with *L. macropterus* (Brauer) but differs in the anal origin opposite last dorsal ray base. The nominal *Nyctimaster reinhardti* is here described from very poor dried materials and as the arrangement of the photophores is unknown, I place it provisionally with *L. omostigma*. The so-called triangular luminous postorbital body may be the result of preparation of the specimen.

Lampanyctus stilbius Gilbert.

Lampanyctus stilbius Gilbert: Mus. Comp. Zool., Mem., vol. 26, no. 6, p. 235, pl. 6, 1908 (type loc., near Nukuhiva, Marquesas Group, to 300 fathoms).

Differs from *Lampanyctus longipes* (Brauer) in the preocular luminous body on the ventral instead of the dorsal side of the nostril.

Myctophum affine (Lütken) (fig. 13).

Scopelus affinis Lütken: Vid. Selsk. Skr. Kjöbenhavn, 6th ser., vol. 7, p. 252, fig., 1892 (type loc., Atlantic).

Myctophum affine Gilbert: Mus. Comp. Zool., Mem., 26, no. 6, p. 217, 1908 (N. Lat. 1° to 17°, W. Long 135° to 137°; S. Lat. 9°, W. Long. 139° 45′, Marquesas Islands).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 570, 1911 (1912) (N. Lat. 80° 37′, W. Long. 168°; N. Lat. 5° W. Long 151°).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 7, 1925 (Pearl and Hermes Reef).

Rhinoscopelus oceanicus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 168, 1902 (1903) (type loc., N. Lat. 10° 57′, W. Long. 137° 35′) (southeast of Hawaiian islands).

Myctophum margaritatum Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 596, pl. 68, fig. 2, 1903 (1905) (type loc., off Molokai; Lanai; Oahu; Niihau; French Frigates Shoal; between Honolulu and San Francisco).

Head 3 1/3; depth 4; D. 11, 10; A. 11, 16, 1; scales (pockets) 31 in lateral line to caudal base and about 3 more on latter; 10 predorsal scales; snout 6 in head measured from upper jaw tip; eye 3; maxillary 1 2/5; interorbital 3 1/2.

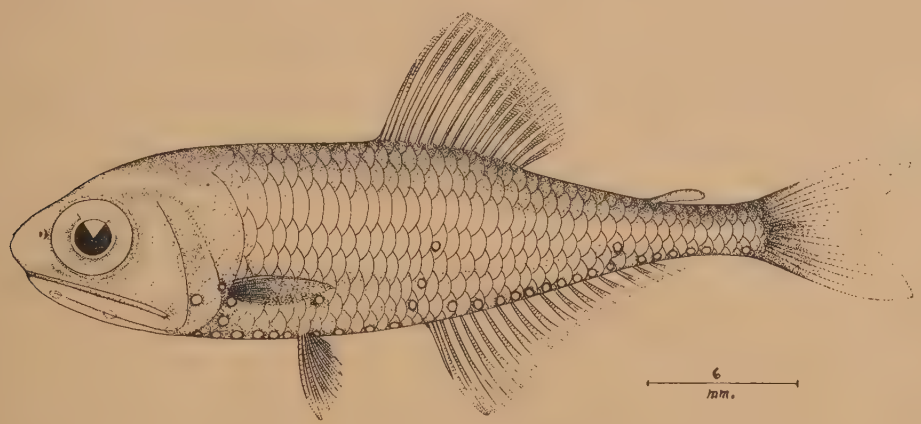

FIGURE 13.—Drawing of young *Myctophum affine*.

Body strongly compressed, tapering rapidly behind to slender caudal peduncle, with least depth 1 1/2 its length or 3 1/5 in total head length.

Head compressed, little longer than deep, upper profile (damaged) apparently little more convex than lower. Snout very short, convex, length little less than half its width. Eye very large. Mouth large, lower jaw very slightly protrudes. Maxillary extends little beyond eye, expansion about 2 3/4 in eye. Bands of fine uniform teeth in jaws, on vomer, palatines and pterygoids. Interorbital narrow, much less than eye and apparently concave. Preopercle ridge well developed, slightly inclined backward, its lower edge not quite reached by maxillary.

Gill rakers 7+18, lanceolate, twice length of gill filaments or 1 1/2 in eye. Isthmus long, narrow.

Scales with 7 or 8 basal radiating striae. Scales in lateral line apparently not enlarged, tubes simple and moderate. Photophores 1 below edge of maxillary; 1 opercular close behind preopercle ridge; 4 pectorals, of which upper 2 humeral, first at lower pectoral base and lowest on edge of gill opening; 2 anterolaterals; 3 mediolaterals; 1 posterolateral; 2 caudals, well sepa-

rated and posterior; 5 thoracic; ventrals apparently 3; anals 6+4; supracaudal luminous gland about half size of adipose fin, little nearer caudal base than adipose fin. Dorsal origin little nearer snout tip than caudal base or about midway between snout tip and front edge of supracaudal luminous organ, fin moderately high, with front rays longest. Adipose fin slightly nearer hind dorsal base than that of caudal, fin about 1 1/4 in eye. Caudal forked, lobes sharply pointed. Anal with front rays elevated, 1 2/3 in head. Pectoral long, pointed, equals total head length, reaches back beyond depressed ventral tip. Ventral inserted slightly before middle in pectoral length, fin 2 1/6 in head. Vent close before anal.

Pale grayish-brown, with dusky marginally and about edges of photophores. Iris pale slaty. Median portion of pectoral, base of dorsal and each caudal lobe pale to whitish. Length 72 mm.

Three in the Bishop Museum from the Honolulu market, 72 to 103 mm. long. The one described above is interesting as showing but a single supracaudal photophore and the 2 caudal photophores well separated. One from Pearl and Hermes Reef in May 1923. In the National Museum 34 Hawaiian specimens and the type of *Rhinoscopelus oceanicus,* obtained September 8, 1899.

Myctophum punctatum Rafinesque.

Myctophum punctatum Rafinesque: Ind. It. Sicil., pp. 35, 56, pl. 2, fig. 5, 1810 (type loc., Sicily).

Scopelus caninianus Günther: Rept. voyage "Challenger," vol. 31, pt. 2, p. 30, 1888 (1889) (off New Guinea to Admiralty Islands).

Differs from *Myctophum affine* in 3 or 4 of the posterior group of the anal photophores above the base of the anal fin.

Widely distributed in the Atlantic, Mediterranean, Indian, and Pacific Oceans.

Myctophum pterotum (Alcock).

Scopelus (*Myctophum*) *pterotus* Alcock: Ann. Mag. Nat. Hist. London, ser. 6, vol. 6, p. 217, 1890 (type loc., N. Lat. 18° 30′, E. Long. 84° 46′ in 98 to 102 fathoms [off Madras]).

Myctophum fibulatum Gilbert and Cramer: U. S. Nat. Mus., Proc., p. 411, pl. 38, fig. 3, 1896 (type loc., N. Lat. 21° 13′, W. Long. 157° 43′ 37″ in 310 fathoms).

Supra-anal photophores angulated; anals 5 or 6 + 4 or 5; second ventral elevated, vertically above first; first 2 supra-anals in line with supraventral.

Gilbert contends (Carnegie Mus., Mem., vol. 6, no. 2, p. 81, 1913) that *M. fibulatum* is distinct from *M. pterotum.* He gives a series of distinctive characters which may be valid.

Indian, Pacific, and south Atlantic.

Myctophum evermanni Gilbert.

Myctophum evermanni Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 597, pl. 70, fig. 2, 1903 (1905) (type loc., south of Oahu; off Lanai; Niihau; Laysan).—Gilbert: Mus. Comp. Zool., Mem., vol. 26, no. 6, p. 218, 1908 (N. Lat. 5° to 170°, W. Long. 135° to 137°; S. Lat. 16° 39′, W. Long. 148° 11′, Marquesas Islands).

Supra-anal photophores angulated; second ventral photophore not elevated; 1 posterolateral; second precaudal little above first, far below lateral line; all posteroanals behind anal fin, 4 to 6 in number.

Ten specimens from Hawaii in the National Museum.

Myctophum reinhardti (Lütken).

Scopelus reinhardti Lütken: Vid. Selsk. Skrift. Kjöbenhavn, 6th ser., vol. 7, p. 257, fig. 16, 1892 (type loc., N. Lat. 34° 22′, W. Long. 18° 10′ [designated as type by Gilbert]).

Myctophum reinhardti Gilbert: Mus. Comp. Zool., Mem., vol. 26, no. 6, p. 219, 1908 (N. Lat. 1° 45′, W. Long. 137° 36′).

Myctophum braueri Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 598, 1903 (1905) (type loc., south of Oahu; off Lanai; Niihau; Oahu).

Myctophum lutkeni Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, pl. 70, fig. 1, 1903 (1905) (error).

Myctophum hollandi Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 11, pl. 1, fig. 2, 1922 (type loc., Honolulu).

Differs from *Myctophum evermanni* in the presence of 2 posterolaterals; front posteroanals above anal fin; second precaudal widely separated from first.

Neoscopelus macrolepidotus Johnson.

Neoscopelus macrolepidotus Johnson: Zool. Soc. London, Proc., vol. 33, p. 44, pl. 7, 1863 (type loc., Maderia).—Gilbert and Cramer: U. S. Nat. Mus., Proc., vol. 19, p. 414, 1897 (N. Lat. 21° 8′ 30″ to 21° 12′, W. Long. 157° 49′ to 157° 38′ 30″ in 343 to 375 fathoms).—Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 601, 1903 (1905) (off Molokai; French Frigates Shoal; Bird Island; Kauai; west of Hawaii; 222 to 800 fathoms).

Luminous organ below each ventral scale. Anal remote from dorsal. Length 240 mm.

Five Hawaiian specimens in the National Museum.

Widely distributed in tropical seas.

Rhinoscopelus cocco (Cocco) (fig. 14).

Scopellus cocco Cocco: Giorn. Sci. Sicilia, vol. 26,

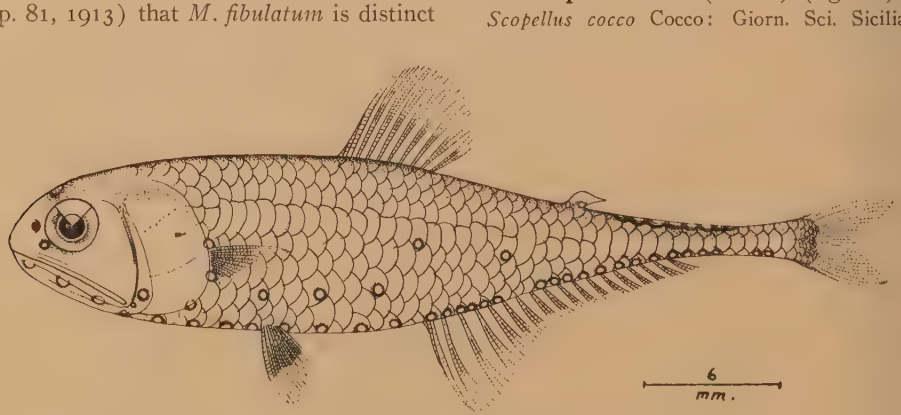

FIGURE 14.—Drawing of young *Rhinoscopelus cocco.*

p. 77, 1829 (type loc., Sicily).—Cocco: Isis, vol. 24, p. 1341, 1831 (Messina).

Scopelus coccoi Schmeltz: Mus. Godeffroy, Cat. 5, p. 35, 1874 (Pacific Ocean).—Schmeltz: op. cit., Cat. 6, p. 17, 1877 (Pacific Ocean).—Günther: Rept. voyage "Challenger," vol. 31, pt. 2, p. 30, 1888 (1889) (South Pacific; Mid-Pacific; near Admiralty Islands to Japan).

Scopelus (Rhinoscopelus) coccoi Lütken: Kon. Dansk. Vid. Selsk. Skrift., 2nd ed., vol. 7, p. 242, fig. 2, 1890-94 (1892) (N. Lat. 10°, W. Long. 137°).

Scales cycloid, adherent, greatly enlarged in lateral line. Head short, with projecting snout. Caudal peduncle very slender, elongated. Length 60 mm.

Tropical seas, widely distributed.

Rhinoscopelus tenuiculus (Garman).

Myctophum tenuiculum Garman: Mus. Comp. Zool., Mem., vol. 24, p. 262, pl. J, fig. 5, 1899 (type loc., San Mariato Point in 100 fathoms).

Rhinoscopelus tenuiculus Gilbert: Mus. Comp. Zool., Mem., vol. 26, no. 6, p. 222, 1908 (N. Lat. 10° 57′ 35″, W. Long. 137° 35′ 25″).

Differs from *Rhinoscopelus cocco* in 7 ventral rays (8 in *Rhinoscopelus cocco*).

MALACOSTEIDAE

Malacosteus indicus Günther.

Malacosteus indicus Günther: Ann. Mag. Nat. Hist. London, 5th ser., vol. 2, p. 181, 1878 (type loc., Pacific Ocean in 500 fathoms).

Length of caudal peduncle less than half length of dorsal fin. Ventral origin nearer caudal base than hind suborbital luminous organ. Length 112 mm.

ALEPISAURIDAE

Alepisaurus ferox Lowe (fig. 15).

Alepisaurus ferox Lowe: Zool. Soc. London, Proc., p. 104, 1833 (type loc., Atlantic Ocean at Madeira).

Plagyodus ferox Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 571, 1911 (1912) (N. Lat. 5°, W. Long. 164°).

Dusky translucent, lips and ventral filaments terminally white, other fins jet black. Length 550 mm. (Gilbert).

One Hawaiian specimen, type, in the National Museum.

BELONIDAE

Belone platyura Bennett.

Belone platyura Bennett: Comm. Zool. Soc. London, Proc., p. 168, 1831 (type loc., Mauritius).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 122, fig. 38, 1903 (1905) (Honolulu; Kailua; Samoa).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 296, 1905 (1906) (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 250, 1911 (Kambara, Fiji; Funafuti).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 2, 1919 (Hawaiian islands).—Fowler: Copeia, no. 122, p. 82, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 6, 1925 (Guam).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 7, 1925 (Laysan, Lisiansky, and Ocean islands).—Fowler: op. cit., Bull. 38, p. 7, 1927 (Christmas and Baker islands, Honolulu).

Belone platura Streets: U. S. Nat. Mus., Bull., vol. 7, p. 75, 1877 (Honolulu).—Waite: Australian Mus. Mem., no. 3, p. 194, 1897 (Funafuti).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 228, 1898 (Guam).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 512, 1901 (Laysan).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 21, 1902 (Honolulu).—Snyder: U. S. Fish Comm., Bull., vol. 22, p. 521, 1902 (1904) (Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 12, 1906 (Faté, New Hebrides).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 349, fig. of head, 1909 (Pelew Islands; Hawaiian islands).

Belone platyurus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 433, 1902 (1903) (Honolulu).

Hemiramphus platurus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 13, 1906 (Rarotonga, Cook Islands).

Esox bellone (non Linné) Lichtenstein: Descriptiones animalium, Forster, p. 257, 1844 (Tanna Island).

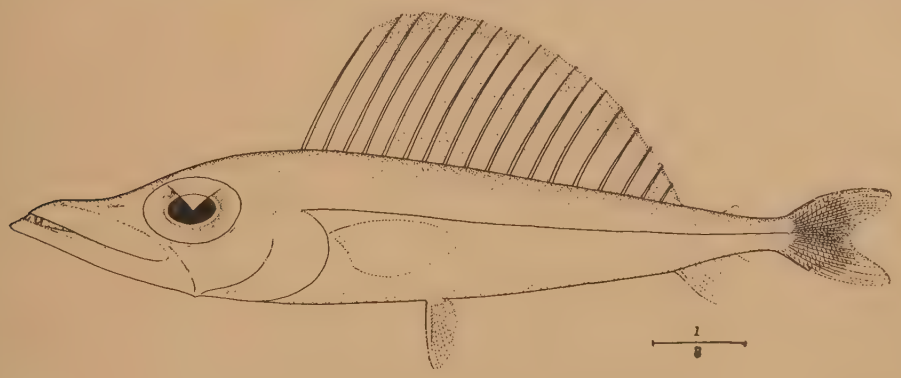

FIGURE 15.—Drawing of larval *Alepisaurus ferox*.

Readily distinguished by the long, high dorsal fin, which occupies nearly the whole of the back, followed by an adipose fin. Body long, slender, scaleless. Snout long, pointed. Mouth cleft wide, with triangular, pointed teeth.

ATELEOPIDAE

Ateleopus plicatellus Gilbert.

Ateleopus plicatellus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 653, fig. 253, 1903 (1905) (type loc., Pailolo Channel in 294 to 684 fathoms; Oahu in 257 to 297 fathoms).

D. 9; A. and caudal 104; gill rakers 10, short, thick.

Belone carinata Valenciennes: Hist. nat. Poiss., vol. 18, p. 324, 1846 (type loc., Guayaquil to Hawaiian islands).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 25, 1869 (Pacific Ocean).

Belone persimilis Günther: Mus. Godeffroy, Jour., vol. 16, pt. 8, p. 349, fig. of head, 1909 (type loc., Hawaiian islands; Tonga; Yap; northwest Caledonia).

Head (from upper jaw tip) 2 7/8 to 2 9/10; depth 1 1/10 to 1 1/6 in postocular; D. II, 11; A. II, 15 or 16; scales 175 to 196 in lateral series to caudal base; 95 to 103 predorsal scales to head; end of frontal process to eye 4 1/2 to 5 in rest of snout and width equals its length; eye 1 3/4 to 1 7/8 in postocular; interorbital 1 3/4 to 2.

Body broad, rather cylindrical, more pronounced in depression behind, so width greater than depth after dorsal origin. Least depth of caudal peduncle half its width or 2 3/4 in eye.

Head moderately constricted below, width 1 1/5 to 1 1/3 in postocular. Jaws not completely closing basally and lower longer. Eye close to upper profile, not impinging. Maxillary concealed, about reaches opposite front eye edge. Moderate band of fine outer teeth and single row of rather well-spaced larger inner ones. Triangular nasal cavity 3/4 of pupil. Interorbital and top of head level, though broad shallow depression medially. Bones on top of head rather obscurely striate. Gill opening extends forward opposite eye center. Gill rakers IV or V, 3 +6, XI (or 5, X) short points, about 2 1/2 in gill filaments, which 1/3 of eye. Scales small, rounded on back, except enlarged median row; about 34 to 54 close-set circuli, complete with age. Lateral scales larger and elongate. Cheek scales in 9 rows. Lateral line with short branch up to pectoral base, extends along lower surface of lateral keel along caudal peduncle side to caudal base. Dorsal inserted little behind anal or about last fourth between hind eye edge and caudal base, front lobe elevated and fin much smaller than anal. Caudal forked. Pectoral longer than postocular by 1/3 to 1/2 of eye. Ventral inserted about midway between gill opening and caudal base; fin 1 1/4 to 1 2/5 in postocular.

Brownish on back, sides and below silvery-white. Fins brownish. Iris white.

In the Bishop Museum 6 from Honolulu, 3 from Faté and 2 from Rarotonga. One obtained at Laysan in 1903 by W. A. Bryan. At Palmyra C. Montague Cooke, Jr., procured 1 in 1913 and Thurston and Thaanum 2 in 1922. When fresh these 1922 specimens had back greenish with a purplish tinge, lower side and below bright silvery-white. Also 4 from Laysan and 1 from Ocean Island. In the Honolulu market I examined 16 specimens in November and December, 1922. The largest specimen seen 456 mm. long. In the Agassiz Museum 1 from Funafuti, 8 from Honolulu obtained by W. H. Jones and 10 from the Society Islands, half from Andrew Garrett. In the National Museum 4 from Honolulu of which most from T. H. Streets, 1 from Apia and 3 from Kambara, Fiji. Two in the Academy from the Hawaiian islands, obtained by J. K. Townsend. Of interest historically, as they are among the first specimens from this locality, having been obtained several years before the species was described by Valenciennes as *Belone carinata.*

Widely distributed in the Indo-Pacific.

STRONGYLURA Van Hasselt

Subgenus STRONGYLURA

Scales large. Caudal obtusely rounded or truncate.

Strongylura strongylura (Van Hasselt).

Belone strongylura Van Hasselt: Algem. Konst. Letterbode, p. 131, 1823 (type loc., Batavia, Java).

Belone strongylurus Regan: Zool. Soc. London, Trans., vol. 20, pt. 6, p. 276, 1914 (Mimika River, New Guinea).

Mastacembelus strongylurus Bleeker: Atlas ichth., vol. 6, p. 45, pl. (11) 257, fig. 3, 1869-72 (New Guinea).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 38, 1878 (New Guinea).

Body slightly compressed, tail somewhat more compressed. Head 2 1/2 to 2 2/3; eye 2 3/5 to 4 in postocular. Scales about 170. D. I, 10 to II, 13; A. II, 13 to 15; caudal rounded, with median black blotch. Length 450 mm. (Weber and Beaufort).

Ceylon, British India, Formosa, East Indies, North Australia, New Guinea.

Strongylura urvillii (Valenciennes).

Belone urvillii Valenciennes: Hist nat. Poiss., vol. 18, p. 330, 1846 (type loc., Vanicolo).

Belone macrolepis Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 126, 1926 (Langenak Bay, east New Guinea).

Body robust. Head 2 2/3 in entire body. Teeth slender, very pointed. Suborbital little scalloped. Cranium grooved and striate. Scales strong, compact, present on suborbital, jaws and opercles. D. 13; A. 15; longest rays of either equal fin base; caudal rounded; pectoral 5 times between gill opening and caudal tip. Back green; broad silvery lateral band; broad blue-black band at dorsal and anal basally. Length 407 mm. (Valenciennes).

Weber and Beaufort (Fishes Indo-Australian Archipelago, vol. 4, p. 122, 1922), after an examination of the type of *Belone macrolepis* Bleeker, conclude it may questionably be the same.

Strongylura krefftii (Günther).

Belone krefftii Günther: Cat. fishes Brit. Mus., vol. 6, p. 250, 1861 (type loc., Australia).—Regan: Zool. Soc. London, Trans., vol. 20, pt. 6, p. 276, 1914 (Mimika River, New Guinea).

Belone kreffti Weber: Nova Guinea, vol. 9, pt. 4, p. 553, 1913 (Lorentz River).

Tylosurus kreffti Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 4, p. 123, 1922 (New Guinea).

? *Belone cancila* (non Buchanan-Hamilton) Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 592, 1882 (New Guinea).

Strongly compressed. Eye 2 3/5 to 3 4/5 in postocular, equals interorbital. Canines slender, straight. Scales 170 to 190. D. II, 14 to 16; A. II, 17 to 19. Ventral origin midway between caudal base and hind preopercle edge. Caudal truncate. Brownish above, slightly silvery below; indistinct lateral postanal silvery band. Length 650 mm. (Weber and Beaufort)

New Guinea and Queensland.

Strongylura leiura (Bleeker).

Belone leiurus Bleeker: Nat. Tijds. Ned. Ind., vol, 1, p. 94, 1850 (1851) (type loc., Batavia, Java).

Tylosurus annulatus (non Valenciennes) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 64, 1900 (1901) (Guam).

Head about 2 1/3; depth 17 1/5; D. II, 17, 1; A. II, 19, 1; scales 153 to caudal base from upper hind edge of gill opening and about 12 more on caudal base; 112 predorsal scales to occiput; eye 2 1/5 in postocular; interorbital 2 1/10.

Body apparently compressed. Head with rather wide median depression on frontals to cranium. Jaws not completely closing basally. Maxillary with only narrow lower edge exposed, apparently would reach pupil. Rounded nasal pit about 2/3 of pupil. Interorbital and bones on top of head with coarse parallel striae. Opercle width 1 2/5 that of cheek. Gill opening forward about opposite front pupil edge. Scales with 17 to 28 vertical striae, separate. Lateral line on ridge, though without distinct keel along caudal peduncle and caudal base.

Front lobes of dorsal and anal moderate; first branched dorsal ray 1 1/10 in postocular; first branched anal 1 1/10; last dorsal rays uniform or shorter than median. Caudal apparently with only very slight concave hind edge, so that lobes of fin scarcely distinct, though lower apparently little longer. Pectoral 1 1/10 in postocular, ventral 1 3/5.

Dull brownish generally, sides and below paler or whitish and separated by dusky line extending from shoulder to caudal base medianly. Three fine median lines down back. Fins dull brown.

One in the Bishop Museum, obtained by Alvin Seale at Guam, July 14, 1900, 320 mm. long. This is doutbless Seale's specimen quoted above, though he gives its length as 14 inches (355 mm.). I have also examined a specimen in the Agassiz Museum from Ebon Island, received from Rev. B. G. Snow, in April 1877, which is 608 mm. It shows the D. II, 18 and the hind caudal edge concave. This species has not previously been reported from Oceania.

Distributed from British India, Ceylon, East Indies, Formosa to the Marshall Islands and Guam.

Strongylura incisa (Valenciennes).

Belone incisa Valenciennes: Hist. nat. Poiss., vol. 18, p. 335, 1846 (type loc., Grand Ocean).—Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 126, 1926 (Kewieng Nusa, New Mecklenburg).

Belone liuroides Günther: Rept. voyage "Challenger," vol. 1, p. 57, 1880 (Nares Harbor, Admiralty Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 593, 1882 (New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 352, 1909 (Admiralty Islands; Pelew Islands, Ponapé, Ruk).

Tylosurus leiuroides Jordan and Seale: (U.S.) Bur. Fish., Bull., vol. 25, p. 206, 1905 (1906) (Apia).

Strongly subcylindrical. Eye 2 to 2 1/2 in postocular, 1 1/5 or somewhat less in interorbital. Canines slender, straight. Scales 180 to 190. D. II, 17 to 18; A. II, 20. Caudal slightly emarginate. Brown above, lighter below, with indistinct silvery lateral band. Length 600 mm. (Weber and Beaufort)

Differs from *Strongylura leiura* in the advanced dorsal origin, which over second divided ray of anal and the larger head.

Indo-Pacific.

Subgenus TYLOSURUS Cocco

Scales small or minute. Caudal deeply emarginate or forked.

Strongylura tahitiensis Fowler and Bean.

Strongylura tahitiensis Fowler and Bean: U. S. Nat. Mus., Proc., vol. 63, p. 10, 1923 (type loc., Tahiti).

? *Belone depressa* (non Poey) Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 374, 1879 (Rotuma).

? *Tylosurus platurus* (non Bennett) Waite: South Austral. Mus., Records, vol. 5, p. 3, 1903 (Paanopa, Ocean Island, Gilbert Group).

D. II, 14; A. II, 17; scales 315. Differs from all the fork-tailed species of Oceania in the reduced fin rays. Length 640 mm.

Strongylura indica (Le Sueur) (Pl. III, *D*).

Belona indica Le Sueur: Acad. Nat. Sci. Philadelphia, Jour., vol. 2, pt. 1, p. 130, 1821 (type loc., Indian Ocean).

Strongylura indica Fowler: Copeia, no. 122, p. 82, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 6, 1925 (Guam), p. 23 (Honolulu).

Belone annulata Valenciennes: Hist. nat. Poiss., vol. 18, p. 332, 1846 (type loc., Celebes; Tongatabu; Seychelles; Pondicherry).—Günther: Rept. voyage "Challenger," vol. 1, p. 36, 1880 (Levuka, Ovalau and Kandavu, Fiji).—Macleay: Linn. Soc. New South Wales, Proc., vol. 5, pt, 2, p. 176, 1881 (Percy Islands and Cape York).—Macleay: op. cit., vol. 7, p. 592, 1882 (New Guinea).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 512, 1901 (Honolulu; Samoa).

Tylosurus annulatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 64, 1900 (1901) (Guam; part).—Seale: op. cit., vol. 1, no. 5, pp. 18, 19, 1902 (Honolulu).

Tylosurus giganteus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 433, 1902 (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 124, fig. 39, 1903 (1905) (Honolulu; Hilo).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 12, 1906 (Tubuai, Austral Islands).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 207, 1905 (1906) (Samoa).

Belone gigantea Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 350, 1909 (tropical Pacific).

Head 4; depth 18 2/5; head from tip of frontal process 1 1/8 in rest of head length; D. II, 21, 1 to 24, 1; A. II, 18 to 22; scales 327 in median lateral series to caudal base and 10 more on latter; 255 predorsal scales to occiput; eye 2 1/8 to 2 2/5 in postocular; interorbital 1 7/8.

Body cylindrical. Head level above, with slight median depression, wider on parietal region. Jaws not completely closing basally. Maxillary with narrow lower border exposed, reaches opposite pupil. Deep oblique nasal slit long as pupil. Interorbital and bones on top of head with fine parallel striae. Opercle wide as cheek. Gill opening extends forward to front eye edge.

Lateral line with slight keel along caudal peduncle and base of caudal though not especially rigid. Scales with 34 to 46 rather fine, complete circuli. Last dorsal rays longer than median; both dorsal and anal with well falcate anterior lobes; first branched dorsal ray 1 in postocular; first branched anal ray 1 1/8; upper caudal lobe 1 2/5 in lower; pectoral 1; ventral 1 1/8.

Dull dusky above, sides and lower surfaces paler. Dorsal and anal pale basally, former with dusky terminal lobe and anal brownish terminally, other fins brown.

In the Bishop Museum 4 from Honolulu, 1 from Tubuai, and 2 from Guam, largest 1090 mm. In the Honolulu markets I examined 17 specimens, though few were brought in at one time. Largest 1216 mm. The National Museum has 2 Hawaiian specimens obtained by the Wilkes Expedition. Also an adult through the Bureau of Fisheries from Honolulu. A small specimen in the Academy, from Honolulu.

Ranges from the Seychelles and British India to the East Indies, Japan, and Hawaii.

Strongylura choram (Rüppell).

Belone choram Rüppell: Neue Wirbelth., Fisch., p. 72, 1835 (type loc., Red Sea).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 35, 1874 (Samoa).—Peters: Akad. Wiss. Berlin, Monatsb., p. 848, 1876 (Bougainville Island).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 351, 1908 (Duke of York Island).

Tylosurus choram Seale: B. P. Bishop Mus., Occ Papers, vol. 4, no. 1, p. 12, 1906 (Tahiti).

Head 3 1/8; depth in trunk (without head or caudal fin) 8 4/5; D. II, 23; A. II, 21; P. 1, 12; scales about 340 to caudal base, counted in median lateral row from gill opening; 19 scales above lateral line to dorsal origin,

5 below; 272 predorsal scales; eye 2 1/5 in post-ocular; interorbital 1 5/6. About 18 rows of scales across cheek. Last dorsal ray long as least depth of caudal peduncle. Olivaceous brown above, sides and below paler to whitish. Dorsal lobe and edge of median rays blackish.

One in the Bishop Museum, 715 mm. long with caudal tips damaged.

Bleeker mentions the black anal edge in his description of *Mastacembelus melanotus* (Atlas ichth., vol. 6, p. 47, 1866-72), though figures the species as *Mastacembelus choram* (op. cit., vol. 6, pl. [10] 256, fig. 2, 1866-72) which is otherwise in agreement.

East Atlantic and Indo-Pacific to Samoa and Tahiti.

Strongylura crocodila (Le Sueur).

Belona crocodila (Peron and Le Sueur) Le Sueur: Acad. Nat. Sci. Philadelphia, Jour., vol. 2, pt. 1, p. 129. 1821 (type loc., Mauritius).

Belone crocodilus Thiollière: Fauna Woodlark, p. 204, 1857 (Woodlark Island).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 24, 1869 (Samoa).

Mastacembelus annulatus Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).

Belone melanotus Jouan: Soc. Cherbourg, Mem., vol. 21, p. 334, 1877-78 (on Jouan, op. cit., vol., 8, p. 303, 1861, Kanala, New Caledonia).—Peters: Akad. Wiss. Berlin, Monatsb., p. 848, 1876 (1877) (New Britain).

In the National Museum 1 from Fiji or Samoa, obtained by the Wilkes Expedition. From the label I find the locality as "south-east of Tahiti."

Quoted by Thiollière as *Orphie rov,* from Montrouzier, though Thiollière later, or on the next page, refers to it apparently as *Belone rov.*

Indo-Pacific to Formosa, Japan, and Samoa.

Strongylura auloceps Fowler and Bean.

Strongylura auloceps Fowler and Bean: U. S. Nat. Mus., Proc., vol. 63, p. 12, 1923 (type loc., Fiji or Samoa).

Subcylindrical, caudal peduncle compressed, its width half its least depth. Eye 3 in postocular; interorbital 1 7/8. Sculpturing on head prominent. Opercles naked. Scales 300 in lateral series. D. II, 21; A. II, 20. Caudal apparently moderately emarginate. Brownish, sides and below with silvery. Length 485 mm. (Fowler and Bean)

Differs from *Strongylura crocodila* in the pronounced sculpturing on the cranium.

Strongylura appendiculata (Klunzinger).

Belone appendiculatus Klunzinger: Zool. Bot. Ges. Wien, Verh., vol. 21, p. 580, 1871 (type loc., Red Sea).

Belone appendiculata Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 351, fig. of head, 1909 (Solomon Islands).

Thalassosteus appendiculatus Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., 4th ser., vol. 16, p. 651, November 14, 1927 (Honolulu).

Tail subcylindrical, little deeper than wide, with very low keel at end of lateral line. Head smooth above. Eye equals interorbital or half of postorbital. Below end of lower jaw large, compressed, horny appendage. D. 26, hind rays somewhat elongated, last reaches caudal. A. 22 or 23. Lower caudal lobe longer than upper. Length 915 mm. (Günther)

Red Sea, Solomon Islands, Hawaii.

Strongylura fijiense Fowler and Bean.

Strongylura fijiense Fowler and Bean: U. S. Nat. Mus., Proc., vol. 63, p. 13, 1923 (type loc., Fiji).

Unique in the greatly increased scales, 450 in a median lateral series. D. II, 22; A. II, 16; eye 2 1/3 in postocular. Length 738 mm.

Ablennes hians (Valenciennes) (Pl. III, *E*).

Belone hians Valenciennes: Hist. nat. Poiss., vol. 18, p. 321, pl. 548, 1846 (type loc., Havanna; Bahia).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 353, fig. of head, 1909 (Hawaiian islands).

Athlennes hians Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 433, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 521, 1902 (1904) (Lahaina, Maui).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 125, fig. 40, 1903 (1905) (Honolulu).

Ablennes hians Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., 4th ser., vol. 16, p. 652, November 14, 1927 (Honolulu).

Readily known by its extremely compressed, band-like body. Reaches 1000 mm.

In the Bishop Museum, 3 from Honolulu, largest 773 mm. In the Agassiz Museum 3 from Hawaii collected by Andrew Garrett. I examined 97 specimens in the Honolulu markets in December 1922 and January 1923.

Circumtropical.

HEMIRAMPHIDAE

Euleptorhamphus longirostris (Cuvier).

Hemiramphus longirostris Cuvier: Regne animal, 2nd ed., vol. 2, p. 285, 1829 (type loc., the Indies; on Russell).

Hemirhamphus longirostris Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 358, 1909 (Hawaiian islands).

Euleptorhamphus longirostris Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 434, 1902 (1903) Honolulu).—Snyder: op. cit., vol. 22, p. 522, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 128, fig. 43, 1903 (1905) (Honolulu).

Hemiramphus macrorhynchus Valenciennes: Hist. nat. Poiss., vol. 19, p. 40, pl. 556, 1846 (type loc., open sea, E. Long. 177°, S. Lat. 7°; Peyster Islands, Polynesia).

Hemirhamphus (Euleptorhamphus) macrorhynchus Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 511, 1901 (South Sea).

Euleptorhamphus macrorhynchus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 19, 1902 (Honolulu)

One from the Hawaiian islands obtained by the Wilkes Expedition, 400 mm. long (beak and caudal damaged), now in the National Museum. Also another Hawaiian specimen received from the Bureau of Fisheries. In the Bishop Museum 6 from Honolulu, the largest 484 mm.

Jordan and Evermann describe the interorbital flat, the head naked and the dorsal inserted apparently little more posterior. The above specimens show the head with traces of scales and the interorbital decidedly concave. Compared with an Atlantic specimen in the Academy from Atlantic City, New Jersey, I can find no characters of specific value. The Atlantic City specimen has gill rakers 8+25. Its scales have unconnected parallel vertical circuli, 20 to 26 basally and 100 to 120 apically, sometimes basal groove medianly on edge. Günther's contention for a single circumtropical species in this genus seems likely.

HEMIRAMPHUS Cuvier

Seale has listed a specimen, No. 1221 Bishop Museum, from Shortland, Solomon Islands as *Hemiramphus melanurus* Valenciennes (Hist. nat. Poiss., vol. 18, p. 31, 1846, Celebes). I have been unable to locate the specimen.

Subgenus HYPORHAMPHUS Gill

Ventrals inserted nearer head than caudal base. Scales moderate or large.

Hemiramphus unifasciatus Ranzani.

Hemiranphus unifasciatus Ranzani: Acad. Sci. Inst. Bonon., Nov. Comm., vol. 5, p. 326, 1842 (type loc., Brazil).

Hemirhamphus unifasciatus Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 126, 1926 (Hansa Bay, New Guinea).

Compressed, depth 8 to 10; head from upper jaw tip 2 1/2 to 3 1/5; eye 1 2/5 to 1 1/2 in postorbital, equals interorbital; scales 50 to 55; D. II, 12 to 14; A. II, 12 to 15, insertion opposite dorsal origin; caudal deeply emarginate. Rather narrow silvery lateral band, bordered above by black line; beak dusky, tip scarlet in life; fins hyaline, dorsal and caudal bordered with blackish. Length 305 mm.

East Africa, India, East Indies, Philippines; Pacific coast of Panama; Atlantic coasts of tropical America.

Hemiramphus gaimardi Valenciennes.

Hemiramphus gaimardi Valenciennes: Hist. nat. Poiss., vol. 19, p. 27, 1846 (type loc., Moluccas; Amboina; New Guinea; Port Jackson).

Hemirhamphus gaimardi Bleeker: Atlas ichth., vol. 6, p. 60, pl. 253, fig. 5, 1866-72 (New Guinea).

Hemiramphus limbatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, pt. 3, p. 64, 1900 (1901) (Guam).

Somewhat compressed, depth 8 1/5 to 11; head from upper jaw tip 3 1/2 to 3 3/5; eye 1 1/2 in postorbital, equals interorbital; scales 50; D. II, 12 or 13; A. II, 12 to 14, insertion opposite dorsal origin; caudal deeply emarginate; rather narrow silvery lateral band, with narrow black border line above; fins hyaline, upper and front border of dorsal and upper, lower and hind border of caudal black; length 312 mm. (Weber and Beaufort)

Six in the Bishop Museum from Guam, 147 to 241 mm. long.

British India, East Indies, New Guinea.

Hemiramphus pacificus Steindachner.

Hemirhamphus pacificus Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 511, 1901 (type loc., Laysan Island).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 15, 1902 (Hilo).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 356, 1909 (Hawaiian islands).

Hemiramphus pacificus Jordan and Seale: (U.S.) Bur. Fish., Bull., vol. 25, p. 207, 1905 (1906) (Pago Pago).

Hyporhamphus pacificus Snyder: U. S. Fish Comm., Bull., vol. 22, p. 522, 1902 (1903) (Laysan Island).—Jordan and Evermann: op. cit., vol. 23, p. 126, fig. 41, 1903 (1905) (Kailua).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 6, 1919 (Hawaiian islands).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 114, 1922 (Pago Pago; Hawaii).—Fowler: Copeia, no. 122, p. 82, Nov. 20, 1922 (Hawaii).

Head from upper jaw tip 4 1/2 to 5 1/8; depth 10 to 11 1/2; D. II, 12 or 13; A. II, 15 to 17; scales 62 from gill opening to caudal base; 40 to 42 predorsal scales; head behind eye 2 1/2 to 3 1/4 in beak; snout 2 3/5 to 2 3/4; eye 4 to 4 1/2; maxillary 3 to 3 1/4; interorbital 3 7/8 to 4 1/2. Gill rakers 6+20, lanceolate, about 1/3 of gill filaments. Scales with 3 to 6 basal striae; 12 to 18 basal circuli; 15 or 16 outer circuli.

Seven from Honolulu in the Bishop Museum and 1 from Laysan, 316 mm. long, received from W. A. Bryan. I obtained a specimen at Waikiki on October 29, 1922. Nine in the Agassiz Museum from Hawaii, of which 6 obtained by Andrew Garrett. Eight in the National Museum from Samoa, Hawaii, and Laysan. Two Hawaiian specimens in the Academy.

Hemiramphus acutus Günther.

Hemirhamphus acutus Günther: Zool. Soc. London, Proc., p. 671, 1871 (type loc., Rarotonga, Cook Islands).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 356, 1909 (types).

Body nearly 4-angled; head little over 3 to caudal base; snout beyond end of lower jaw half of head; eye 1 2/3 in postorbital, little less than interorbital; triangular upper jaw formed by premaxillaries somewhat longer than wide; vertex and interorbital flat; scales 53, dorsal and anal scaleless, nearly equal, former but slightly advanced; D. 13 or 14; A. 17; caudal forked, lower lobe longer; side with silvery lateral band; length 152 mm. (Günther)

Differs from *Hemiramphus pacificus* in the larger scales.

Hamiramphus japonicus Brevoort.

Hemiramphus japonicus Brevoort: Exped. Perry Japan, 2, p. 280, pl. 49, 1856 (type loc., Lew Chew).

Hyporhamphus japonicus Tanaka: Coll. Sci. Tokio, Jour., vol. 23, no. 7, p. 29, 1908 (Hobajima, Bonin Islands).

Little compressed; head 2 2/3 to center margin of caudal; beak from upper jaw tip little less than half of total head length; scales 54; D. 14; A. 12, origin below middle of dorsal base; lower caudal lobe longer; bluish, dark on back, lighter below; lower beak dark; dorsal and caudal dusky, paired fins little lighter, anal whitish; length 318 mm. (Tanaka)

RHYNCHORHAMPHUS new subgenus

Type *Hemiramphus georgii* Valenciennes.

Distinguished from subgenus *Hemiramphus* Cuvier by the very long beak or lower jaw, also the upper jaw with its triangular portion longer than broad. It agrees with *Hemiramphus* in the posterior insertion of the ventrals.

(ῥύγχος, snout: ῥάμφος, beak; with reference to both the elongated snout and beak.)

Hemiramphus georgii Valenciennes.

Hemiramphus georgii Valenciennes: Hist. nat. Poiss., vol. 19, p. 27, pl. 555, 1846 (type loc., Mahe Bay, Coromandel).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 228, 1898 (Guam).

Hemirhamphus cantori Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 593, 1882 (New Guinea).

Head 2 3/4 to 2 4/5; depth 13 to 13 1/4; D. II, 13; A. II, 15; scales about 50 (pockets) from above gill opening to caudal base; 38 predorsal scales (pockets); snout 2 1/2 to 2 2/3 in head measured from upper jaw tip; eye 4 1/5 to 4 2/5; maxillary 3 1/10 to 3 1/8; interorbital 4 1/8 to 4 1/5.

Body long, slender, robust, width about 4/5 its depth. Caudal peduncle compressed, least depth half its length or 5 1/6 to 5 1/4 in head measured from upper jaw tip. Head width 3 to 3 1/5 in its length, flattened sides approximated rather closely below. Snout depressed, width at eye 1 2/5 to 1 2/3 its length; snout width at rictus little less than its length. Eye center midway in

head; diameter 1 3/5 to 1 3/4 in snout, equals interorbital. Maxillary largely concealed posteriorly. Teeth fine, simple, conic, in narrow bands in jaws. Nostrils together, in cavity close before eye; nasal cavity about 3/5 of pupil. Interorbital level. Preorbital 1 4/5 in eye. Gill rakers 11+23, lanceolate, 1 1/4 in gill filaments which 2 1/5 in eye. Scales very caducous, nearly all fallen. Dorsal origin about last third between pectoral tip and caudal base, front rays 2 3/5 in head; anal origin slightly behind that of dorsal, first branched ray 2 4/5 to 3 1/8 in head; caudal broad, slightly emarginate, lower lobe 1 1/6 to 1 2/5; pectoral 1 1/2 to 1 2/3; ventral inserted midway between pectoral origin and caudal base, 2 4/5 to 2 7/8 in head.

Back pale brown, sides and lower surface white, with silvery sheen. Leaden streak or line from above gill opening to caudal base medianly. Fins all pale brown, dorsal with outer surface dusky. Iris silvery-white. Length 223 to 244 mm.

Readily distinguished by the upper free portion of the snout a little longer than wide.

In the Agassiz Museum 2 from the Kingsmill Islands by Andrew Garrett.

Ranges from Mauritius, Seychelles, to India, East Indies, Guam, and the Kingsmills.

Subgenus HEMIRAMPHUS Cuvier

Ventrals inserted posteriorly, much nearer caudal base than head.

Hemiramphus balinensis Bleeker.

Hemiramphus balinensis Bleeker: Nat. Tijds. Ned. Ind., vol. 17, p. 170, 1858-9 (type loc., Boleling, Bali).

Hemirhamphus balinensis Waite: Australian Mus., Mem., no. 3, p. 195, 1897 (Funafuti, Ellice Islands).

? *Hemirhamphus intermedius* (? non Cantor) Schmeltz: Mus. Godeffroy, Cat. 4, p. 25, 1869 (Samoa).

Compressed, depth 11 to 16; head from upper jaw tip 3 1/10 to 3 1/2; eye 1 1/2 to 1 1/8 in postorbital, equals interorbital; scales 58 to 60; D. 11, 13 to 15; A. 11, 14 to 16, insertion below or slightly behind dorsal origin; caudal forked; each scale on back with dark brown spot; silvery lateral band, broadest below dorsal origin, above with rather conspicuous blackish-blue border line; fins mostly dusky; length 220 mm. (Weber and Beaufort)

East Indies, Ellice Islands.

Hemiramphus affinis Günther.

Hemirhamphus affinis Günther: Cat. fishes British Museum., vol. 6, p. 267, 1866 (type loc., South Sea).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 355, 1909 (Samoa).—Fowler: B. P. Bishop Mus., Bull. 22, p. 31, 1925 (Samoa).

Hemiramphus affinis Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 13, 1906 (Faté, New Hebrides; Makatea, Paumotus).—Jordan and Seale: (U.S.) Bur. Fish., Bull., vol. 25, p. 207, 1905 (1906) (Pago Pago).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 251, 1911 (Tarawa, Gilbert Islands; Kusaie and Moen, Carolines; Wotje Atoll, Marshalls; Arhno).

Hemiramphus australensis Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 12, 1906 (type loc., Tubuai, Austral Islands).

Head, measured from upper jaw tip, 4 1/2; depth 8 2/5 to 9 1/3; D. 11, 13 or 14; A. 11, 14; P. 1, 11; scales 55 or 56 from gill opening to caudal base and 4 to 6 more on latter; 37 or 38 predorsal scales to eyes; snout 2 1/2 to 2 3/5 in head measured from upper jaw tip; eye 3 2/3 to 4; maxillary 3 2/5; interorbital 3 1/3 to 4; least depth of caudal peduncle 5 2/3. Snout width at front of eyes half its length. Maxillary extends 3/4 to eye. Gill opening extends forward opposite front eye edge. Gill rakers 9+23, lanceolate, 1 1/6 in gill filaments, which 2 1/2 in eye. Scales with 47 to 82 connected circuli. Front portions of dorsal and anal covered with small scales. First branched dorsal ray 3 in head measured from upper jaw tip. Anal origin very slightly behind dorsal origin, first branched ray 3 1/4 in head from upper jaw tip. Caudal well forked, lower lobe longer. Ventral inserted little nearer caudal base than pectoral origin, fin 3 1/5 in head from upper jaw tip; pectoral 1 7/8. Dull brown above, sides and below paler. Base of each scale pocket on back dusky. Slaty line down middle of back to occiput and one from pectoral axil to middle of caudal base. Fins uniform brownish. Iris slaty, with brownish curtain above.

In the Bishop Museum the type of *Hemiramphus australensis* from Tubuai, 267 mm. long. The two distinct grooves on the interorbital are very evident longitudinally. Also 4 from Fatè and 2 from Makatea. The largest specimen 308 mm. In the National Museum 28 specimens, from Wotje, Arhno, Moen, Marshall Islands, and Samoa. In the Agassiz Museum 1 from Tarawa in the Gilbert Islands, 3 from Pago Pago and 8 from Apiang, Kingsmills, last from Andrew Garrett. One in the Academy from Apia.

Hemiramphus brasiliensis (Linné).

Esox brasiliensis Linné: Systema nat., 10th ed., p. 314, 1758 (type loc., in Southern America [Jamaica]).—Lichtenstein: Descriptiones animalium, Forster, p. 155, 1844 (tropical Pacific Ocean), p. 257 (Tanna Island).—Kittlitz: Denkw. Reis. Mikronesien, vol. 2, p. 20, 1858 (Ualan).

Hemiramphus brasiliensis Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 434, 1902 (1903) (Honolulu).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 7, 1919 (Honolulu).—Fowler: Copeia, no. 122, p. 82, Nov. 20, 1922 (Hawaii).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 8, 1925 (Lisiansky).

Hemiramphus depauperatus Bennett: Beechey's Voy., Zool., p. 66, 1839 (type loc., Oahu).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 499, pl. 19, fig. 3, 1900 (Hawaiian islands).—Snyder: U. S. Fish Comm., Bull., vol. 22, p. 522, 1902 (1903) (Honolulu and off Molokai in 13 fathoms).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 127, fig. 42, 1903 (1905) (Honolulu).

Hemirhamphus depauperatus Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 127, 1902 (1903) (Marcus Island).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 357, 1909 (Greenwich Island).

Hemirhamphus pacificus (non Steindachner) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 19, 1902 (Honolulu).

Hemiramphus eclancheri Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 13, 1906 (Nukuhiva, Marquesas Islands).

Head from snout tip 4 1/5 to 4 2/5; depth 6 3/4 to 6 4/5; D. 11, 11; A. 11, 10; scales 58 from gill opening to caudal base and 6 more on latter; 42 predorsal scales; snout 2 7/8 to 3 in head, from its own tip; eye 4 1/10 to 4 1/5; maxillary 3 7/8 to 4; interorbital 3 7/8 to 4 1/4; pectoral 1 1/5 to 1 1/4. Gill rakers 11 + 29, lanceolate, nearly long as gill filaments or 1 7/8 in eye.

The above note from 3 Nukuhiva specimens in the Bishop Museum, 291 to 354 mm. Besides these 5 from Honolulu, 2 from Marcus Island and 1 from Palmyra Island, obtained in 1922 by Thurston and Thaanum. One from Lisiansky obtained in 1923. In the Honolulu

markets I examined 50, November 18, 1922, and 3 on December 23. Four Hawaiian specimens in the National Museum. One in the Academy from Honolulu.

Tropical Atlantic and Pacific Oceans.

Hemiramphus quoyi Valenciennes.

Hemiramphus quoyi Valenciennes: Hist. nat. Poiss., vol. 19, p. 26, 1846 (type loc., Port Dorey, New Guinea).—Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 249, 1852 (New Guinea).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 5, 1859 (Port Dorey).—Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 350, 1876 (Hall Sound, New Guinea).

Hemirhamphus quoyi Bleeker: Atlas ichth., vol. 6, p. 57, pl. 252, fig. 1, 1866-72 (New Guinea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 6, p. 247, 1881 (southern New Guinea).—Macleay: op. cit., vol. 7, p. 593, 1882 (New Guinea).—Weber: Nova Guinea, vol. 5, pt. 2, p. 229, 1908 (Etna Bay, southwest New Guinea).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 104, 1913 (Beo, Waigiu).—Weber: Nova Guinea, vol. 5, pt. 2, p. 229, 1908 (Etna Bay, southwest New Guinea).

According to Weber and Beaufort differs from *Hemiramphus erythrorinchus* in the shorter lower jaw, its length beyond end of upper jaw 6 3/5 to 9 4/5 in length (in *Hemiramphus erythrorinchus* 4 1/2 to 5 1/5).

Three specimens from New Guinea in the National Museum, largest 338 mm. long.

East Indies, Philippines, Queensland.

Hemiramphus erythrorinchus Le Sueur.

Hemiramphus erythrorinchus Le Sueur: Acad. Nat. Sci. Philadelphia, Jour., vol. 2, pt. 1, p. 137, 1821 (type loc., near Timor and Mauritius).—Fowler: B. P. Bishop Mus., Bull. 22, p. 6, 1922 (Guam).

? Hemiramphus eclancheri Valenciennes: Hist. nat. Poiss., vol. 19, p. 37, 1846 (type loc., Marquesas Islands).

Hemirhamphus dussumieri Schmeltz: Mus. Godeffroy, Cat. 5, p. 36, 1874 (South Sea).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 354, 1909 (Funafuti; Jaluit; Bonham Islands; Fiji; Society Islands).

Hemiramphus dussumierii Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 251, 1911 (Namuka, Tonga; Mille, Marshalls; Kusaie, Carolines; Fakarava, Paumotus; Vavau, Tonga Islands; Suva, Fiji; Guam).

Hyporhamphus samoensis Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1418, 1906 (type loc., Upolu).

Head 2 2/3 to 2 5/6 (beak slightly damaged); depth 10 2/3 to 13 3/4; D. 11, 13, 1; A. 11, 12 to 14; snout 2 1/2 to 2 3/4 in head measured from upper jaw tip; eye 3 1/3 to 4 1/4; maxillary 3 1/4 to 3 2/5; interorbital 3 1/2 to 4.

Body moderately long, subcylindrical, nearly wide as deep. Caudal peduncle moderately compressed, least depth 1 4/5 to 2 in its length or 4 4/5 to 5 in head. Head width 2 2/3 in its length. Snout depressed, very slightly broader than long. Eye large, slightly impinging on upper profile, center midway in head, from snout tip; diameter 1 1/4 in snout, equals interorbital, 1 1/3 in postorbital. Maxillary largely concealed, about reaches opposite front nostril. Teeth minute, in narrow bands in jaws. Nostrils together, front one at least third in snout, hind one close before front eye edge. Interorbital flat. Preorbital about size of pupil. Gill rakers 10 + 23, lanceolate, 3 1/5 in eye. Scales very caducous, most all fallen. Dorsal origin at last fourth between hind eye edge and caudal base; anal origin but very slightly behind dorsal origin, fin base 1 1/4 in that of dorsal base; caudal (damaged) apparently little emarginate; pectoral 1 1/2 to 1 4/5 in head, measured from snout tip; ventral 2 4/5 to 3, inserted midway between pectoral and caudal bases.

Back brown. Sides and lower surface silvery-white, also iris. Fins all pale. Length 166 to 325 mm.

In the Agassiz Museum 4 from Apiang, Kingsmill Islands, obtained by Andrew Garrett. One obtained by the Wilkes Expedition at Fiji, in the National Museum, also 1 from Samoa. Others from the *Albatross* collections are 1 from Nielle in the Marshall Islands, 8 from Vavau, 5 from Namuku, 1 from Guam, 1 from Suva, and 1 from the Caroline Islands.

The very imperfectly described *Hemiramphus eclancheri* may be synonymous. Valenciennes gives the following:

Beak 1/4 total length; upper beak pointed; teeth very fine; cranium narrow above, little convex at neck, feebly channeled between eyes, superciliaries little elevated; D. 16; A. 13; dorsal and anal elevated; pectoral short; silvery lateral band, with blue or green border streak above; caudal and beak blackish, other fins transparent; length 160 mm.

Hemiramphus laticeps Günther.

Hemirhamphus laticeps Günther: Cat. fishes Brit. Mus., vol. 6, p. 267, 1866 (type loc., Fiji).—Garman: Mus. Comp. Zool., Bull., vol. 39, p. 238, 1903 (Suva, Fiji).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 355, 1909 (types).

Head 5 (tip of beak damaged); depth 10 3/4; D. 15; A. 15; snout 3 1/4 in head from upper jaw tip; eye 2 7/8; maxillary 3 1/8; interorbital 3 2/3.

Body long, slender, subcylindrical. Caudal peduncle compressed, least depth half its length or 5 1/4 in head. Head width 2 1/2 in its length, flattened sides moderately approximated below. Snout depressed, long as wide. Eye very large, hind pupil edge midway in head; diameter greater than snout or interorbital. Maxillary concealed, reaches opposite front nostril. Teeth fine, simple, conic, in narrow bands in jaws. Nostrils together, close before eye above. Interorbital flat. Preorbital slightly less than pupil. Gill rakers 4 + 21, lanceolate, equal gill filaments, which 2 1/2 in eye. Scales very caducous, very small, most all having fallen. Dorsal origin at last third between pectoral origin and caudal base, front rays 1 4/5 in head; anal origin opposite dorsal, fin similar; caudal broad, slightly emarginate, 1 1/3; pectoral 1 4/5; ventral inserted midway between pectoral origin and caudal base, fin equals eye.

Back pale brown, with 2 parallel median lines of dusky dots and a double row of 10 large and more conspicuous dots or spots, otherwise middle of back minutely dotted with dusky. Lead-colored line from pectoral origin, widening below dorsal and along caudal peduncle to caudal base medianly. Fins all pale. Upper surface of head and opercles pale brownish, spotted and specked with darker or blackish. Streak along side of mandible blackish. Upper jaw dusky. Iris leaden-silvery. Median dusky line from chest to vent. Length 48 mm. (tip of beak damaged).

In the Agassiz Museum 1 from Fiji, through A. Agassiz.

Hemiramphus far (Forskål).

Esox far Forskål: Descriptiones animalium, pp. 13, 67, 1775 (type loc., Lohaja, Red Sea).

Hemirhamphus far Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1417, 1906 (Upolu).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 353, 1909 (Ponapé; Pelew Islands; Fiji; Society Islands).

Hemiramphus far Kendall and Goldsborough: Mus. Comp Zool., Mem., vol. 26, p. 252, 1911 (Vauvau,

Tonga).—Weber: Siboga Exped., vol. 65, p. 129, 1913 (Atjatuning, west coast New Guinea).

Hemiramphus moar Thiollière: Fauna Woodlark, p. 205, 1857 (type loc., Woodlark Island).

Hemirhamphus commersonii Schmeltz: Mus. Godeffroy, Cat. 4, p. 25, 1869 (Samoa).—Castelnau: Zool. Acclim. Soc. Victoria, Proc., vol. 2, p. 120, 1873 (Noumea, New Caledonia).—Günther: Rept. voyage "Challenger," vol. 1, p. 36, 1880 (Kandavu, Fiji).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 593, 1882 (New Guinea).

Hemiramphus commersonii Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 13, 1906 (Shortland Island, Solomons).

Hemiramphus marginatus Jouan: Soc. Cherbourg, Mem., vol. 21, p. 334, 1877-78 (on Jouan, op. cit., vol. 8, p. 304, 1861, Port de France and Kanala, New Caledonia).

Easily known by 4 to 9 large black lateral blotches. Reaches 500 mm.

The Bishop Museum has 2 from Shortland Island, 320 to 331 mm. The National Museum has 1 from Samoa and 1 from Fiji, obtained by the Wilkes Expedition. Also 1 from Vauvau received from the *Albatross* and 3 from New Guinea.

Ranges from East Africa and the Red Sea to the East Indies, Riu Kiu and Society Islands.

Hemiramphus marginatus (Forskål).

Esox marginatus Forskål: Descriptiones animalium, pp. 13, 67, 1775 (type loc., Djedda, Red Sea).

One in the National Museum obtained by the Wilkes Expedition at Tongatabu. This species, known from the Red Sea to the East Indies, has not before been reported from Oceania. *Hemirhamphus welsbyi* Ogilby (Roy. Soc. Queensland, Proc., vol. 21, p. 91, 1908, Queensland) is apparently allied in squamation, though its dorsal and anal are said to be scaleless. The anal has 12 or 13 rays.

Subgenus OXYPORHAMPHUS Gill

Hemiramphus argenteus F. D. Bennett.

Hemiramphus argenteus F. D. Bennett: Narrative whaling voyage, vol. 2, p. 269, woodcut, 1840 (type loc., S. 3°, N. 5° Pacific Ocean).

The following may be made out from the crude, imperfect figure, besides the fragmentary notice:

Body long, compressed; beak not longer than head; eye about half of snout; dorsal and anal placed far back, opposite each other; caudal lobes equally long; pectoral long, slender, shown as little longer than head from upper jaw tip; ventral inserted about midway between gill opening and caudal base; uniformly silver-white and iris silvery; length 102 mm. (from Bennett).

Possibly *Hemiramphus convexus* Weber and Beaufort (Fishes Indo-Australian Archipelago, vol. 4, p. 159, fig. 57, or head, 1922, Timor and between Gebe and Fau) based on specimen but 76 mm. long, may also be the same. The ventral bases are said to be somewhat nearer to the caudal base than to the ends of the pectorals.

ZENARCHOPTERUS Gill

Subgenus LABIDORHAMPHUS Fowler

Upper jaw little over its length to twice as long as wide.

Zenarchopterus caudovittatus (Weber).

Hemiramphus (*Zenarchopterus*) *caudovittatus* Weber: Nova Guinea, vol. 5, pt. 2, p. 229, pl. 3, fig. 1, a-b, 1908 (type loc., Merauke River mouth, New Guinea).

Zenarchopterus caudovittatus Mohr: Zool. Jahrbücher, Jena, vol. 52, p. 242, 1926 (Merauke, New Guinea).

Compressed, depth 9 1/10 to 10; head from upper jaw tip 2 3/5; eye 2 in postorbital, less than interorbital; scales 45; D. 12; A. 12; ventral origin twice nearer caudal than front eye edge or mouth corner; faint lateral silvery band bordered above, below dorsal and on tail by black stripe, ends in dark blotch at caudal base; front anal and lower caudal borders blackish; length 160 mm. (Weber and Beaufort)

Subgenus ZENARCHOPTERUS Gill

Upper jaw long as wide or wider than long.

Zenarchopterus novae-guineae (Weber).

Hemiramphus (*Zenarchopterus*) *novae-guineae* Weber: Nova Guinea, vol. 9, pt. 4, p. 553, 1913 (type loc., Lorentz River; Verlaten Bocht; Regen Island; Rivierkamp; Biwak; Island; Sabang; Alkmaar).

Zenarchopterus novae-guineae Mohr: Zool. Jahrbücher, Jena, vol. 52, p. 247, fig. 12, anal fin, 1926 (Lorentz River).

Hemirhamphus buffonis Hase: Jena. Zeits. nat., vol. 51, p. 541, figs. 13-15, 1914 (Sepik, Kaiser-Wilhelm Land, New Guinea).

Compressed, depth 9 3/5 to 11 1/3; head from upper jaw tip 3 to 3 1/3; eye 1 1/2 to nearly 2 in postorbital, equals or little less than interorbital; scales 50 to 53; D. 14; A. 11, 8 or 9; ventral origin twice nearer caudal base than eye; silvery lateral band, bordered above by black stripe, broadest in postanal; caudal and dorsal dusky; length 240 mm. (Weber and Beaufort).

Zenarchopterus kampeni (Weber).

Hemiramphus (*Zenarchopterus*) *kampeni* Weber: Nova Guinea, vol. 9, pt. 4, p. 554, 1913 (type loc., Kaiserin Augusta River, Pioneer Biwak, northern New Guinea).

Zenarchopterus kampenii Mohr: Zool. Jahrbücher, Jena, vol. 52, p. 248, figs. 13-14, anal fin, 1926 (Kaiserin Augusta River and Ramu).—Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 127, 1926 (Kaiserin Augusta River).

Head from upper jaw tip 4 to caudal base. D. 1, 10, A. 1, 10. Triangular part of upper jaw long as wide. Lower jaw extended. Dorsal origin opposite that of anal. Caudal truncate. Both sexes with modified anal rays.

Two in the National Museum from New Guinea, 177 and 184 mm.

Zenarchopterus brevirostris (Günther).

Hemirhamphus brevirostris Günther: Cat. fishes Brit. Mus., vol. 6, p. 274, 1866 (on Kner).

Zenarchopterus brevirostris Mohr: Zool. Jahrbücher, Jena, vol. 52, p. 250, 1926 (Dörperspitze, New Guinea; Liebliche Island, Linden Harbor and Rein Bay, New Pommerania; New Lauenburg; Papitalai, Saha, Drugul and Bird Island Bay, Admiralty Islands; Saonek, Waigiu).—Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 127, 1926 (New Guinea, New Pommerania, Admiralty Islands).

Hemirhamphus dispar (non Valenciennes) Kner: Akad. Wiss. Wien, Sitz., vol. 39, p. 537, fig. 3, 1860 (type loc., East Indies).

Hemiramphus dispar Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 593, 1882 (New Guinea).

Zenarchopterus dispar Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 358, 1909 (Ponapé; Guadalcanar; Samoa: Fiji).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 252, 1911 (Kusaie, Carolines; Suva, Fiji; Guam).

Hemirhamphus (*Zenarchopterus*) *dispar* Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 104, 1913 (Saonek, Waigiu).

Differs from *Z. dispar* in male with fifth anal ray elongated, thickened and forming flap like lobe behind, also sixth ray forms short flap behind.

Mozambique, Madagascar, Seychelles, Andamans, Siam, East Indies, Philippines, Queensland, Melanesia, Micronesia, Polynesia.

Zenarchopterus dispar (Valenciennes).

Hemiramphus dispar Valenciennes: Hist. nat. Poiss., vol. 19, p. 42, pl. 58, 1846 (type loc., Java; Madagascar; Moluccas?).

Zenarchopterus dispar Mohr: Zool. Jahrbücher, Jena, vol. 52, p. 254, fig. 16, anal fin, 1926 (Saha, Admiralty Islands; Lindenhafen, New Pommerania; Ponapé).—Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 127, 1926 (Saha; Lindenhafen).

Zenarchopterus vaisiganus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 208, fig. 11, 1905 (1906) (type loc., Vaisigano River at Apia, Samoa).

Head 3 2/3 to 4 1/6; depth 6 7/8 to 7 4/5; D. III, 9; A. II, 10; scales 39 in median lateral series from above gill opening to caudal base and 4 more on latter; 7 scales transversely, 38 predorsal; snout 2 7/8 in head measured from upper jaw tip; eye 4 to 4 1/10; maxillary 2 3/5 to 3 1/8; interorbital 3 2/5 to 3 1/2; beak to upper jaw, 1 3/5 in total head length.

Body rather robust, moderately long, convex above, sides approximated below. Caudal peduncle well compressed, length 3/4 its least depth, which 3 7/8 to 4 in head. Head width 2 3/5 to 3 in its length, flattened sides converging below. Snout depressed, width 4/5 its length Eye large, hind pupil edge midway in head length; diameter 1 1/2 to 1 3/5 in snout, 1 1/6 to 1 1/5 in interorbital. Maxillary concealed, reaches opposite front nostril. Teeth fine, simple, in narrow bands in jaws, upper band broader anteriorly; palate toothless. Nasal filament 2/3 of eye; nostrils close together, close before upper front eye edge. Interorbital level. Gill rakers 5 + 12, lanceolate, about equal gill filaments, which 2 3/4 in eye. Scales narrowly imbricated, rather caducous; with 4 to 10 basal radiating striae; circuli rather coarse. Caudal base with small scales, other fins naked. Lateral line inferior, along lower side of body, extends to midde of caudal base; tubes all slender, simple and well exposed. First branched dorsal ray in male 1 1/3 in head, in female 2 3/4; caudal obtusely rounded behind, 1 1/6 to 1 1/4; pectoral 1 1/4 to 1 1/2; ventral 2 3/4 to 2 4/5.

Dull brownish, edge of each scale on back deep brown. Narrow silvery leaden line from pectoral origin to middle of caudal base. Sides and lower surface of body silvery-white. Upper surface of beak dusky, side and side of head, also eye, silvery-white. Fins all brownish-gray. Length 140 to 171 mm.

In the Agassiz Museum 2 from Kusaie, Caroline Islands. Also 2 from Strong's Island, Caroline Islands, obtained by Rev. B. G. Snow. In the National Museum 14 from Suva.

Zenarchopterus dunckeri Mohr.

Zenarchopterus dunckeri Mohr: Zool. Jahrbücher, Jena, vol. 52, p. 255, fig. 17, fins, 1926 (type loc., Friedrich Wilhelm Harbor and Segaar Bay, New Guinea; Rein Bay, New Pommerania; Kewieng Nusa, New Mecklenburg).—Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 127, 1926 (types).

Differs from *Zenarchopterus dispar* in the sixth anal ray of the male elongated and nearly twice as long as all others (whereas in *Z. dispar* fourth and seventh anal rays of male elongated and thickened).

East Indies, Melanesia.

Zenarchopterus buffonis (Valenciennes).

Hemiramphus buffonis Valenciennes: Hist. nat. Poiss., vol. 19, p. 36, 1846 (type loc., Pulo-Pinan).—Peters: Akad. Wiss. Berlin, Monatsb., p. 848, 1876 (1877) (Segaar Bay).

Hemirhamphus (*Zenarchopterus*) *buffonis* Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 104, 1913 (Soanek and Bajon, Waigiu).

Zenarchopterus buffonis Bleeker: Atlas ichth., vol. 6, p 62, pl. (7) 254, fig. 3, 1866-72 (New Guinea).

Zenarchopterus buffoni Mohr: Zool. Jahrbücher, Jena, vol. 52, p. 260, 1926 (Ponapé; Pelew Islands; Varangoi River, Cape Pedar, Luschan Harbor, Rein Bay, Tavanatangir Harbor, Hanam Harbor and Möwe Harbor, New Pommerania; Papitalai and Bird Island Bay, Admiralty Islands; Dorperspitze, east of Long Island, Langemak Bay and Kaiserin Augusta River, New Guinea).—Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 126, 1926 (same localities).

Zenarchopterus maculosus Garman: Mus. Comp. Zool., Bull., vol. 39, p. 239, pl. 5, fig. 4, 1903 (type loc., Suva, Fiji).

Compressed, depth 7 1/2 to 10; head from upper jaw tip 2 2/5 to 3; eye 1 1/2 to 1 9/10 in postorbital, 1 1/5 in interorbital; scales 40 to 45; D. 11 or 12; A. 11 or 12; ventral origin twice nearer caudal base than front eye edge; silvery lateral band, bordered above by faint black line; black line along middle of upper side of lower jaw and continued backward to between eyes, forming median longitudinal stripe on triangular part of upper jaw; dorsal and anal black terminally, caudal more or less dusky; length 230 mm. (Weber and Beaufort)

The type of *Zenarchopterus maculosus* in the Agassiz Museum.

Bombay, East Indies, New Guinea, Philippines, Melanesia, Micronesia. Differs from *Zenarchopterus dispar* in anal base shorter, 2½ to 3 in that of dorsal.

EXOCOETIDAE

Parexocoetus brachypterus (Richardson).

Exocoetus brachypterus (Solander) Richardson: British Assn. Adv. Sci., Rept. Ichth. China, Japan, p. 265, 1845 (1846) (type loc., Tahiti).—Streets: U. S. Nat. Mus., Bull., no. 7, p. 75, 1877 (Hawaiian islands).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 362, 1909 (Pelew Islands; Port Mackay; Tahiti).

Exocoetus brachiopterus Valenciennes: Hist. nat. Poiss., vol. 19, p. 95, 1846 (Tahiti).

Exocoetus brachyopterus Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 512, 1900 (Honolulu; Laysan).

Parexocoetus brachypterus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 435, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 522, 1902 (1904) (off Molokai).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 131, pl. 3, 1903 (1905) (Honolulu; Hilo).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 10, 1919 (Hawaiian islands).—Fowler: Copeia, no. 122, p. 82, Nov. 20, 1920 (Hawaii).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 8, 1925 (Lahaina, Maui).

Exocoetus brevipinnis Valenciennes: Hist. nat. Poiss., vol. 19, p. 89, 1846 (type loc., Carteret Harbor, New Ireland).—Günther: Cat. fishes Brit. Mus., vol. 6,

p. 280, 1866 (copied).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 362, 1909 (New Mecklenburg).

Exocoetus rostratus Günther: Cat. fishes Brit. Mus., vol. 6, p. 280, 1866 (type loc., Hawaiian islands).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 363, 1909 (type).

Parexocoetus rostratus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 131, 1903 (1905) (copied).

Exocoetus hillianus Lütken: Vidensk. Meddel. Nat. Foren., p. 397, 1876 (Honolulu).

Exocoetus mento Schmeltz: Mus. Godeffroy, Cat. 6, p. 18, 1877 (Pelew Islands).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 39, 1885 (Rubi, New Guinea).

Exocoetus mento Macleay: Linn. Soc. New South Wales, Proc., vol. 4, p. 64, 1879 (Solomons).

Exocoetus mesogaster (non Bloch) Jordan and Meek: U. S. Nat. Mus., Proc., p. 47, 1885 (Hawaiian islands).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 47, pt. 1, p. 728, 1896 (Hawaiian islands).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 500, 1900 (same material).

Parexocoetus mesogaster Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 17, 1902 (Honolulu).

The Bishop Museum has 16 from Honolulu, largest 186 mm. One from off Lahaina, Maui, contains 1 from the stomach of a gannet (*Sula*), head damaged, from the Phoenix Islands. Length 168 mm.

Exocetus kuag Thiollière is described with pectoral half the length of the trunk, ventral separated from anal by a space less than own length, total length 180 mm. Montrouzier named this species *Microstome* or *Exocet kuag* in manuscript.

East Indies, Australia, Hawaii, Galapagos, tropical and subtropical Atlantic.

Exocoetus volitans Linné (fig. 16).

Exocoetus volitans Linné: Systema nat., 10th ed., p. 316, 1758 (type loc., Pelagic in high seas of Europe and America).—Lichtenstein: Descriptiones animalium, Forster, p. 155, 1844 (tropical Pacific).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 500, 1900 (Hawaiian islands).—Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 127, 1902 (1903) (Marcus Island).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 435, 1902 (1903) (Honolulu; N. Lat. 28° 3′, W. Long. 143° 10′).—Snyder: op. cit., vol. 22, p. 522, 1902 (1904) (N. Lat. 24°, W. Long. 151°; near Oahu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 132, 1903 (1905)

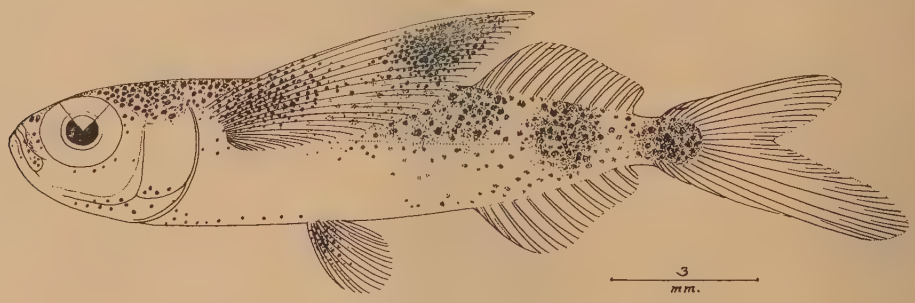

FIGURE 16.—Drawing of young *Exocoetus volitans*.

in June 1923. In the National Museum 1 obtained by the Wilkes Expedition in the Hawaiian islands. Also 17 from Honolulu, mostly from the Bureau of Fisheries and through T. H. Streets. In the Agassiz Museum 6 from W. H. Jones and 6 from Andrew Garrett, received from Honolulu; also 2 labeled Oahu. One in the Academy from the Hawaiian islands, obtained by J. K. Townsend.

Indo-Pacific to China and Hawaii.

Evolantia microptera (Valenciennes).

Exocoetus microperus Valenciennes: Hist. nat. Poiss., vol. 19, p. 92, pl. 563, 1846 (type loc., Port King George, Australia; Carteret, New Ireland; Buru; Malabar).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 25, 1869 (Savay).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 361, 1909 (New Mecklenburg, Savay, Hawaiian islands).

Evolantia microptera Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 434, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 130, fig. 44, 1903 (1905) (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 8, 1925 (Laysan).

Exocetus kuag Thiollière: Fauna Woodlark, p. 205, 1857 (type loc., Woodlark Island).

In the Agassiz Museum 1 from Kingsmill Islands, 171 mm. long. The National Museum (non fig. 45) (N. Lat. 28° 3′ 42″, W. Long. 143° 10′ 5″).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 15, 1906 (Tahiti).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 252, 1911 (N. Lat. 4° 35′, W. Long. 136° 54′).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 85, 1912 (S. Lat. 0°-7°, W. Long. 82°-102°).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 10, 1919 (Hawaiian islands).—Fowler: Copeia, no. 122, p. 82, Nov. 20, 1922 (Hawaii).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 8, 1925 (Wake Island 108th meridian).—Fowler: op. cit., Bull. 38, p. 7, 1927 (Central Pacific).

Exocaetus volitans Jouan: Soc. Cherbourg, Mem., vol. 9, p. 191, 1863 (between New Caledonia and Tahiti).

Exocoetus melanopus Günther: Ann. Mag. Nat. Hist. London, 4th ser., vol. 1, p. 459, 1868 (type loc., Zanzibar).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 366, 1909 (types; New Pomerania).

Exocoetus georgianus Lütken: Vidensk. Meddel. Nat. Foren., p. 394, 1876 (between Hawaii and Japan in S. 31°, E. 47°).

Exocoetus speculiger (non Valenciennes) Streets: U. S. Nat. Mus., Bull., no. 7, p. 75, 1877 (Honolulu).

Exocaetus evolans De Vis: Linn. Soc. New South Wales, Proc., vol. 8, p. 451, 1883 (New Britain).

Halocypselus evolans Jordan and Meek: U. S. Nat. Mus., Proc., p. 49, 1885 (Hawaiian islands).—Nichols: Am. Mus. Novit., no. 94, p. 3, Oct. 19, 1923 (Ducie Island).

Exocoetus evolans Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 363, 1909 (Tahiti, Samoa, Kingsmills).

Exocaetus longibarba De Vis: Linn. Soc. New South Wales, Proc., vol. 8, p. 454, 1883 (type loc., New Britain).

Head 4; depth 5 4/5 to 6; D. I or II, 12 to 14; A. I or II, 11 to 14; scales 40 to 42 from above gill opening to caudal base and 5 more on caudal base; 6 scales above lateral line to soft dorsal origin, 2 below, 29 predorsal; snout 4 1/8 in head measured from upper jaw tip; eye 3 2/3; maxillary 4 2/5 to 5 1/3; interorbital 2 4/5 to 3.

Body broad above, sides approximated below, deepest at dorsal origin. Caudal peduncle well compressed, least depth 1 3/4 in its length or 4 1/2 in total head length. Head width 2 in its length. Snout short, conic, length 4/5 its width. Eye large, slightly impinging on upper profile, hind edge midway in head length; diameter greater than snout, equals interorbital. Mouth small, superiorly terminal, lower jaw slightly protruding. No teeth. Nasal cavity 3/5 of pupil, close before eye. Interorbital level. Gill rakers 7 or 8 + 24 or 25, lanceolate, 1 2/5 in gill filaments, which 1 1/2 in eye. Scales with 5 basal radiating striae, edge scalloped; circuli very fine. Dorsal origin at last third in combined head and trunk, first branched ray 2 4/5 in total head length; first branched anal ray 2 3/4; lower caudal lobe 3 3/5 in combined head and trunk; ventral 1 4/5 in head, origin nearer gill opening than dorsal origin, depressed fin reaching half way to vent; pectoral reaches caudal base.

Back olivaceous-brown, sides below and under surface silvery-white. Pectoral with borders above and below and terminally dusky. Other fins all pale. Length 207 mm.

In the Agassiz Museum 1 from Honolulu, Hawaiian islands, through W. H. Jones. Also an adult from between Sunday Island and Tonga, and young from Hawaii or the Society Islands received from Andrew Garrett. The National Museum contains 1 from Honolulu obtained by T. H. Streets, another Hawaiian specimen obtained by the *Albatross* and one from the open Pacific. In the Bishop Museum 2 small specimens from Marcus Island. Also 1 young from N. Lat. 10°, W. Long. 160° at the surface, obtained by C. Montague Cooke, Jr. in 1913. Twelve from off Wake Island in 1923, also 1 at the 180th meridian. One in the Academy obtained by W. H. Jones in the Hawaiian islands.

Circumtropical and well into temperate regions.

Cypselurus oxycephalus (Bleeker).

Exocoetus oxycephalus Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 771, 1852 (type loc., Macassar and Batavia).

Cypselurus oxycephalus Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 8, 1925 (off Laysan).

Exonautes gilberti Snyder: U. S. Fish Comm., Bull., vol. 22, p. 522, pl. 7, fig. 13, 1902 (1904) (type loc., near N. Lat. 28 1/2°, W. Long. 140° [northeast of Honolulu]).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 134, pl. 24, 1903 (1905) (type).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 607, 1908 (note).

Cypsilurus unicolor (non Valenciennes) Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 209, fig. 12, 1905 (1906) (south of Samoa; between Sydney and Auckland).

Head 4; depth 4 1/3; D. 11; A. 9; P. v, 10; snout 7 in head measured from upper jaw tip; eye 2; maxillary 3; interorbital 1 2/3.

Body well compressed. Head width 1 1/3 in its length. Snout very short and obtuse. Eye very large, over half length of head. Mouth broad, lower jaw slightly protruding in front. Maxillary inclined close along front eye edge. Row of very minute teeth, at least in upper jaw. Interorbital broadly concave. Gill rakers 5 + 12, lanceolate, about half long as gill filaments. Scales weakly developed, mostly fallen. Back brown, sides and below silvery-white, more or less sprinkled with minute variable dusky dots. Traces of about 3 very pale blotches across belly, now very faint. Dorsal dusky gray terminally, basally whitish. Caudal and anal whitish. Pectoral and ventral blackish, with grayish terminally on outer portions. Iris silvery gray. Length 42 mm.

Reaches a length of 264 mm.

In the Bishop Museum 1 from off Laysan Island, obtained by the Tanager Expedition in 1923. In the National Museum 2 from Apia and the type of *Exonautes gilberti* Snyder.

Widely distributed in the East Indies, Samoa, and Hawaii.

Cypselurus rondeletii (Valenciennes).

Exocoetus rondeletii Valenciennes: Hist. nat. Poiss., vol. 19, p. 84, pl. 562, 1846 (type loc., Naples; Sicily, Canaries).

Cypselurus rondeletii Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 8, 1925 (at 180th Meridian and Laysan).—Fowler: op. cit., Bull. 38, p. 7, 1927 (N. Lat. 6° 40′, W. Long. 171° and between Seattle and Honolulu).

Head 4 to 4 1/5; depth 6; D. 1, 10; A. 1, 10; scales 40 to 43 in lateral series from gill opening to caudal base and 3 more on latter; 5 scales above lateral line to dorsal origin, 32 or 33 predorsal; snout 4 2/3 to 5 in head from snout tip; eye 2 1/8 to 2 1/5; maxillary 3 1/8 to 3 3/5; interorbital 2 to 3.

Body long, rather slender, tapering backward from head. Caudal peduncle well compressed, least depth 1 1/2 to 2 in its length or 3 1/6 to 4 in total head length. Head width 1 2/3 to 1 4/5 in its length. Snout broad, obtuse, length 1/3 to 1/2 its width at front of eyes. Eye large, impinging on upper profile, hind pupil edge little before middle in head length. Mouth small, broad, lower jaw slightly protruded. Maxillary extends little beyond front eye edge, not to pupil. Teeth minute, in single row in jaws, apparently none on palate. Nostrils close together and close before eye. Interorbital broadly concave. Gill rakers 5 + 18, lanceolate, 1 1/5 in gill filaments, which 1 7/8 in eye. Scales with 5 basal radiating striae, edge lobate; circuli 12 to 24. First branched dorsal ray 1 1/4 to 1 2/3 in total head length; second branched anal ray 1 7/8 to 2 1/5; lower caudal lobe 3 to 3 1/4 in combined head and trunk; pectoral reaches base of last dorsal ray base, or middle of dorsal base, 1 2/5 to 1 3/5; ventral inserted much nearer pectoral origin than caudal base, 2 1/2.

Back drab gray, sides and lower surface silvery-white. Iris neutral-gray, with silvery-white reflections. Dorsal dusky, rays whitish. Caudal and anal whitish, only base of former dusky, most of lower lobe with gray. Pectoral and ventral blackish, upper edge of pectoral and most outer or under faces of rays whitish. Ventral with upper and lower edges paler than rest of fin. The species is distinguished by both the first and second pectoral rays simple or undivided at all ages.

In the Bishop Museum 1 from the Tanager Expedition at 180th Meridian, July 24, 1923; 78 mm. long. Also 5 from Laysan, 43 to 71 mm.

Probably circumtropical. Besides the above specimens reported from the Indo-Pacific region at Java and China.

Cypselurus rubescens (Rafinesque).

Exocoetus rubescens Rafinesque: Am. Month. Mag. Crit. Rev., vol. 2, p. 205, 1818 (type loc., Newfoundland Banks).

Cypselurus rubescens Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 8, 1925 (off Lisiansky, Laysan, and Gardner islands).

Exocoetus speculiger Valenciennes: Hist. nat. Poiss., vol. 18, p. 69, 1846 (type loc., Friendly Islands; Sunda Strait, Java; Mauritius; East Indies; Pero-Banhos Islands; South America; Port King George).—Günther: Cruise of "Curacoa," p. 410, 1873 (Solomons).—Lütken: Vidensk. Meddel. Nat. Fören., p. 403, 1876 (from Arabian Gulf to Honolulu).—Streets: U. S. Nat. Mus., Bull., no. 7, p. 75, 1877 (Honolulu).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 366, 1909 (Samoa; Solomons).

Cypsilurus speculiger Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 253, 1911 (Guam).

? Exocoetus evolans Valenciennes: Hist. nat. Poiss., vol. 19, p. 101, 1846 (Cartaret Harbor; Tongatabu).

? *Exocoetus lamellifer* Kner and Steindachner: Akad. Wiss. Wien, Sitz., vol. 54, pt. 1, p. 384, pl. 2, fig. 11, 1866 (type loc., S. Lat. 12°, W. Long. 33°; South Sea).—Lütken: Vidensk. Meddel. Naturh. Fören., p. 405, 1876.

Head 4 1/5; depth 6; D. 1, 9, 1; A. 1, 10, 1; P. 1, 17; scales 49 from gill opening to caudal base and 5 more on latter; 8 scales above lateral line; 40 predorsal scales (damaged); snout 3 1/3 in head measured from upper jaw tip; eye 4; maxillary 4 1/5; interorbital 2 1/2.

Body broad above, sides moderately approximated below, deepest at ventral origin. Caudal peduncle well compressed, least depth 1 1/2 in its length or 4 in head. Head width 1 4/5 in its length. Snout obtuse, length 3/4 its width. Eye large, slightly impinging on upper profile, hind pupil edge midway in head length, diameter greater than snout or 1 1/4 in interorbital. Mouth small, lower jaw protruded. Teeth minute, feeble, obsolete, in band in front of each jaw and on palatines, none on vomer. Nasal cavity half size of pupil, close before eye. Interorbital broad, very slightly concave. Gill rakers 8 + 19, lanceolate, equal gill filaments or 1 7/8 in eye. Scales with 6 or 7 basal radiating striae, edge scalloped; circuli very fine. Dorsal origin at last fourth in combined head and trunk, first branched ray 2 3/5 in head; anal begins little before dorsal or near last third between gill opening and caudal base, first branched ray 2 1/2 in head; caudal widely forked, upper lobe 1 1/2 in lower or 1 1/5 in head; pectoral reaches nearly far as depressed dorsal tip, not quite to caudal base; ventral inserted little nearer gill opening than caudal base, reaches base of ninth branched anal ray, 3 2/3 in combined head and trunk.

Back brown, sides and below whitish. Vertical fins all pale. Pectoral with dusky band above, dusky basally and broad dusky submarginal band leaving broad whitish posterior border, median part of fin whitish. Ventral whitish, with basal portion pale brownish.

In the Agassiz Museum 1 from off Guam, 264 mm. (caudal broken). The Bishop Museum has 4 from off Lisiansky and 2 from off Laysan, largest 508 mm. In the National Museum 1 from Honolulu obtained by T. H. Streets, 5 Hawaiian specimens collected by the *Albatross* and 1 from Guam.

Exocoetus lamellifer as figured by Kner and Steindachner shows the anal origin opposite the base of the second dorsal ray, and the pectoral rays III, 15. It is based on a specimen 95 mm. long, likely the young.

Circumtropical.

Cypselurus arcticeps (Günther).

Exocoetus arcticeps Günther: Cat. fishes British Mus., vol. 6, p. 289, 1866 (type loc., China).

Exocaetus arcticeps Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 278, 1883 (southeast New Guinea).

Head 3 9/10; depth 5 1/2; D. 13; A. 8; scales 47; eye 3 in head, equals concave interorbital and little less than postocular. Anal origin opposite sixth dorsal ray. Pectoral reaches middle of anal, with broad oblique white band across lower half and edge broadly whitish. Ventral white, middle rays grayish. Length 215 mm. (Weber and Beaufort)

China, Japan, New Guinea.

Cypselurus nigricans (Bennett).

Exocoetus nigricans Bennett: Narrative whaling voyage, vol. 2, p. 287, 1840 (Atlantic and Pacific oceans N. Lat. 50°).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 367, 1909 (Indo-Pacific).

Head 4 1/3 to 4 3/5; depth 6 to 7; D. 14 to 16; A. 9 to 11; P. 1, 13 or 14; scales 45 to 50; eye 3 in head, less than postocular, which equals concave inteorbital. Anal origin opposite sixth or seventh dorsal ray. Pectorals quite or nearly reaching caudal base. Pectoral black, with oblique hyaline band tapering back, more developed in young. Hind half of dorsal and ends of ventrals black. Length 260 mm. (Weber and Beaufort).

Atlantic and Indo-Pacific.

Cypselurus altipennis (Valenciennes).

Exocoetus altipennis Valenciennes: Hist. nat. Poiss., vol. 19, p. 80, pl. 560, 1846 (type loc., East Indies; Cape of Good Hope).

Cypsilurus altipinnis Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 129, 1926 (North Pelew Islands).

Cypsilurus katoptron Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 211, fig. 16, 1905 (1906) (south of Samoa).

Head 4 1/8; depth 5 1/4; D. 1, 13; A. 1, 9; scales 47 from gill opening to caudal base and 3 more on latter; 32 predorsal scales; 8 scales above lateral line to dorsal origin; snout 3 1/4 in head from upper jaw tip; eye 3 1/5; maxillary 4 1/4; interorbital 2 3/5.

Body moderately compressed, flattened sides not constricted below. Caudal peduncle well compressed, least depth 1 2/5 in its length or 3 3/4 in total head length.

Head width 1 3/4 in its total length. Snout obtuse, triangular in profile, length 3/4 its width. Eye large, not impinging on upper profile, hind pupil edge midway in head length, diameter slightly greater than snout, 1 1/5 in interorbital. Mouth small, lower jaw slightly protruding. Teeth minute, simple, conic, distinct, in narrow bands in jaws and small patch on palatines, none on vomer. Nasal cavity small, 2/5 of eye. Interorbital wide, very slightly concave. Gill rakers 6 + 15, lanceolate. Scales with 3 to 8 basal radiating striae, edge moderately scalloped; circuli very fine. Dorsal origin at last third between front eye edge and caudal base, first branched ray 1 4/5 in total head length. Anal origin opposite first 2/5 of dorsal base or at last fourth between hind eye edge and caudal base, first branched ray 3 in head. Caudal widely forked, upper lobe 1 1/2 in lower. Pectoral reaches nearly to caudal base, little beyond tip of last depressed dorsal ray. Ventral inserted midway between gill opening and last dorsal ray

base, ray reaches last anal ray base or 3 1/5 in combined head and trunk.

When fresh blue-violet black, violet-slate on upper sides. Lower side and under surface white. On sides rows of scales with darker median streak, darker than ground-color. Iris whitish, tinged darker above. Dorsal and anal pale, unicolor, latter whitish. Caudal dusky. Pectoral with outer third black, basally dusky and oblique broad pale band adjoins black. Ventral pale, median ray brownish. Length 265 mm.

One in the Academy obtained by H. A. Pilsbry, which flew on board a steamer midway between Honolulu and San Francisco in 1920.

Ranges over the Indo-Pacific, east to Hawaii and Samoa.

Cypselurus furcatus (Mitchill).

Exocoetus furcatus Mitchill: Lit. Philos. Soc. New York, Trans., vol. 1, p. 449, pl. 5, fig. 2, 1815 (type loc., New York).—Weber: Zool. Forsch. Austral. (Semon), vol. 5, p. (114) 274, 1895 (coast of New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 365, 1909 (Tahiti).

Cypsilurus bilobatus Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 4, p. 185, 1922 (type loc., south coast of New Guinea).

Head 4; depth 5; D. 13; A. 9 to 11; scales 50; eye 2 2/3 in head, less than postorbital, which equals flat interorbital. Predorsal scales 32. Each side of mouth corner with broad, ribbon-like barbel long as head. Anal origin opposite fifth dorsal ray. Pectorals reach posterior half of dorsal. Pectorals with rows of oblong spots, more or less in transverse rows. Ventral tips black. Length 128 mm. (Weber and Beaufort).

Atlantic and Indo-Pacific. I can find nothing in Weber and Beaufort's description to justify the separation of the Indo-Pacific form from that of the Atlantic.

Cypselurus poecilopterus (Valenciennes).

Exocoetus poecilopterus Valenciennes: Hist. nat. Poiss., vol. 19, p. 81, pl. 561, 1846 (type loc., New Britain).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 368, 1909 (New Pommerania).

Cypsilurus poecilopterus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 210, fig. 14, 1905 (1906) (off western end of Tutuila).

Cypselurus poecilopterus Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 8, 1925 (Johnston Island).

Exocoetus alatus (Solander) Valenciennes: Hist. nat. Poiss., vol. 19, p. 82, 1846 (type loc., Tahiti).

Head 4; depth 4 3/5 to 5; D. 12; A. 7 or 8; P. 1, 14 or 15; scales 45 in lateral line; eye 2 4/5 to 3 in head, somewhat less than postorbital, which equals nearly flat interorbital. Anal origin opposite sixth dorsal ray. Pectorals reach end of dorsal or further. Ventrals almost reaching end of anal. Pectorals with numerous rather large, ovate black spots, distinctly arranged in transverse bands, but absent in lower part of fin. Length 250 mm. (Weber and Beaufort)

One in the National Museum from Samoa. In the Bishop Museum 2 from Johnston Island.

East Indies, Japan, Tahiti.

Cypselurus atrisignis Jenkins.

Cypsilurus atrisignis Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 436, pl. 3, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 136, pl. 25, 1903 (1905) (type).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 210, 1905 (1906) (Kusai or Strong Island, Carolines).

Exocoetus atrisignis Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 368, 1909 (Hawaiian islands; Ualan; Strong Island; Greenwich Island).

Head 4 1/4; depth 5 1/8; D. 1, 12, 1; A. 1, 8, 1; P. 1, 13; scales 53 from gill opening to caudal base and 6 more on latter; 8 scales above lateral line; 37 predorsal scales (damaged); snout 3 3/5 in head measured from upper jaw tip; eye 3 3/5; maxillary 3 2/3; interorbital 2 1/2.

Body anteriorly broad above, sides moderately approximated below, deepest at ventral origin. Caudal peduncle well compressed, least depth 1 1/2 in its length or 3 in total head length. Head width 1 3/4 in its length. Snout obtuse, length 3/4 its width. Eye large, scarcely impinging on upper profile, hind pupil edge midway in head length; diameter equals snout, 1 1/4 in interorbital. Mouth small, lower jaw protruding slightly. Teeth minute, simple, conic, mostly biserial above and triserial below, at least in front of jaws; few small teeth on palatines, none on vomer. Nasal cavity about half size of pupil, near last third in snout. Interorbital broad, slightly concave medianly. Gill rakers 8 + 18, lanceolate, 1 2/3 in gill filaments, which 1 7/8 in eye. Scales with 6 basal radiating striae, edge scalloped; circuli very fine. Second branched dorsal ray 2 in head; anal inserted opposite first third in depressed dorsal, second branched anal ray 4; caudal widely forked, upper lobe 1 1/2? in lower, which 3? in combined head and trunk; pectoral reaches slightly beyond tip of last depressed dorsal ray, though not to caudal base; ventral inserted midway between eye center and caudal base, reaches 2/5 in depressed anal, 3 2/3 in combined head and trunk.

Back brown, sides and below whitish, with silvery reflections. Pectoral dusky-brown, membranes with small scattered blackish spots, most numerous on fin terminally. Dorsal pale or whitish, with rounded blackish median spot. Caudal pale, brownish basally. Anal and ventral whitish. Length 300 mm.

In the Agassiz Museum 1 from Ebon Island. In the National Museum 3 from Honolulu, of which 1 the type of *Cypsilurus atrisignis*.

Malacca, Carolines, Hawaii.

Cypselurus spilopterus (Valenciennes).

Exocoetus spilopterus Valenciennes: Hist. nat. Poiss., vol. 19, p. 82, 1846 (type loc., Oualan, Carolines).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 368, 1909 (Tahiti).

Cypselurus spilopterus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 375, 1923 (Honolulu).

Head 4 to 4 1/5; depth 4 4/5 to 5; D. 1, 11 or 12; A. 1, 8; P. 1, 14 or 15; 54 or 55 scales from gill opening to caudal base and 6 more on latter; 36 predorsal scales; snout 4 to 4 1/4 in head from upper jaw tip; eye 3 to 3 1/4; maxillary 4 to 4 1/3; interorbital 2 1/4 to 2 2/3; least depth of caudal peduncle 2 4/5 to 3. Gill rakers 4 to 6 + 15 or 16, lanceolate, 1 2/5 in gill filaments or 2 3/4 in eye. Scales with 4 basal radiating striae, sometimes 2 or 3 median incomplete auxiliaries, edge scalloped; circuli very fine. Dorsal begins well before anal origin. Pectoral reaches far as end of depressed dorsal. Ventral inserted midway between hind eye edge and caudal base. Brownish generally, paler to whitish below. Pectoral variously spotted with blackish, sometimes as several short blackish bars on membranes above. Dorsal uniform pale brown.

In the Bishop Museum 1 from Honolulu 317 mm. Also 1 from Tahiti received from Alvin Seale in 1901, 278 mm. long. In the Agassiz Museum 5 specimens, of which one from the Society Islands and the others Hawaiian.

Indo-Pacific, east to Tahiti and Hawaii.

Cypselurus naresii (Günther).

Exocoetus naresii Günther: Rept. voyage "Challenger," vol. 31, pt. 2, p. 36, pl. 1, fig. a, 1888 (1889) (type loc., between Fiji and New Hebrides).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 365, 1909 (type).

Head 4; depth 5; D. 10 to 12; A. 8 or 9; P. 1, 13 or 14; scales 45; eye 3 in head, somewhat more or less than postocular and equals or less than flat interorbital. Anal origin opposite fourth to sixth dorsal ray. Pectorals not quite reaching or to end of dorsal. Pectorals black above, or black with upper and lower edges white. Ventrals black, except middle fourth or black with inner border white. Last third of anal always black. Length 175 mm. (Weber and Beaufort)

East Indies and Melanesia.

Cypselurus oligolepis (Bleeker).

Exocoetus oligolepis Bleeker: Nederlandsch Tijds. Dierk., vol. 3, p. 109, 1866 (type loc., Batavia; Bali; Sumatra; Singapore; Makassar; Batjan; Amboina; Banda).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 370, 1909 (Tahiti).

Cypsilurus oligolepis Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 129, 1926 (near New Guinea east of Long Island).

Head 4 1/2 to 5 1/2; depth 4 7/10 to 5 1/2; D. 12 or 13; A. 8 or 9; P. 1, 13 or 14; scales 42 to 45; eye 2 1/2 in head, little less than concave interorbital. Anal origin opposite sixth or seventh dorsal ray. Ventrals inserted little nearer caudal base than hind eye edge. Pectorals to or beyond anal origin, their upper half blackish. Length 260 mm. (Weber and Beaufort)

Zanzibar, China, East Indies, Tahiti.

Cypselurus bahiensis (Ranzani).

Exocoetus bahiensis Ranzani: Acad. Sci. Inst. Bonon., Nov. Com., vol. 5, p. 362, pl. 38, 1842 (type loc., Brazil).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 512, 1900 (Honolulu).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 369, 1910 (Hawaiian islands).

Cypsilurus bahiensis Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 436, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 136, 1903 (1905) (Hilo; Honolulu).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 253, 1911 (Arhno, Marshalls).

Cypsilurus bahiensis Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 8, 1925 (Lisiansky).

Cypsilurus quindecimradiatus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 482, pl. 17, 1899 (type loc., Thornton Island).

Cypselurus quindecimradiatus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 15, 1919 (type).

Cypsilurus spilonotopterus Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 606, fig. 2, 1903 (Hawaii).

Cypselurus tahitensis Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 13, fig. 3, 1906 (type loc., Tahiti).

Exocoetus tahitensis Günther: Mus. Godeffroy, Jour., vol. 8, pt. 14, p. 371, 1909 (Tahiti).

Head 4 to 4 1/4; depth 5 to 5 1/5; D. 1, 12 or 13; A. 1, 9; P. 1, 13 or 14; scales 48 to 57 from gill opening to caudal base and 6 more on latter; 8 scales above lateral line to dorsal origin; 33 to 36 predorsal scales to occiput, where rugose; snout 3 1/4 to 3 2/5 in head from upper jaw tip; eye 3 1/4 to 3 2/5; maxillary 4; interorbital 2 1/3 to 2 5/6. Head width 1 4/5 to 1 7/8 its length. Gill rakers 6+17, lanceolate, 1 1/8 to 1 3/4 in gill filaments or 2 2/3 to 3 in eye. Scales with 6 or 7 basal radiating striae; often 2 or 3 not forming in indentures of scallops; circuli very fine. Anal begins opposite first 2/5 or middle of dorsal base. Upper caudal lobe about 1 3/5 in lower, which an eye diameter longer than pectoral. Pectoral reaches slightly beyond end of dorsal or anal, though not quite to caudal base. Ventral inserted midway between preopercle ridge and caudal base, depressed fin reaching about 2/5 in depressed anal.

Olivaceous above, sides and below silvery-white. Dorsal with large marginal black blotch medianly. Anal and ventral white. Pectoral largely uniform blackish, upper and lower edges pale.

In the Bishop Museum 1 from Honolulu, 437 mm. long and the type of *Cypselurus tahitensis* from Tahiti. Also 1 from Lisiansky, May 14, 1923. In the National Museum 1 Hawaiian and 1 from Arhno. Three Hawaiian specimens in the Agassiz Museum.

Head 4 2/5; depth 6 1/2; D. 1, 14; A. 1, 10?; P. 1, 10; scales about 50? from above gill opening to caudal base; 36? predorsal scales; snout 4 in head measured from upper jaw tip; eye 3 1/5; maxillary 3 1/2; interorbital 2 2/5. Anal origin behind base of sixth branched dorsal ray. Ventral origin midway between gill opening and caudal base. Pectoral reaches at least to tenth dorsal ray base, uniform brown. Dorsal with blackish blotch marginally over fourth to seventh membranes. Length 455 mm.

The above note from the type of *Cypsilurus quindecimradiatus* Fowler in the Academy. The black dorsal blotch omitted in the original account.

Indo-Pacific and Atlantic coast of tropical America.

Cypselurus opisthopus (Bleeker).

Exocoetus opisthopus Bleeker: Nederlandsch Tijds. Dierk., vol. 3, p. 121, 1866 (type loc., Celebes).—Günther: Cat. fishes Brit. Mus., vol. 6, p. 297, 1866 (type).

Cypselurus oligolepis (non Bleeker) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 15, 1906 (Shortland Island, Solomons).

Head 4 1/5; depth 6; D. 11, 9, 1; A. 1, 6, 1; scales 40 from gill opening to caudal base; 29? predorsal scales; snout 3 3/4 in head from upper jaw tip; eye 3 1/4; maxillary 4 1/2; interorbital 2 1/3. Head width 1 2/3 its length. Caudal peduncle compressed, least depth 3 1/2 in head. Snout obtuse, length about half its width. Eye 1 1/4 in interorbital, which level. Gill rakers 6+17, lanceolate, 1 1/2 in gill filaments or 2 1/2 in eye. Dorsal begins well before anal, first branched ray 2 1/10 in head. Pectoral extends far back as tip of last dorsal ray. Ventral inserted about midway between pectoral origin and caudal base and extends back far as tip of last anal ray.

Purplish-brown, pale below. Iris pale slaty. Dorsal and caudal pale brown. Pectoral largely dusky, lower edge broadly whitish, upper narrowly brownish. Ventral dusky medially, border in front and behind widely pale.

One in the Bishop Museum from Shortland Island, Solomon Islands, 203 mm.

Compared with Bleeker's figure of *Exocoetus opisthopus* (Atlas ichth., vol. 6, p. 76, pl. [2], 248, fig. 2, 1866-72) my specimen shows the ventral slightly more anterior. Its posterior insertion is the most salient character, in combination with the reduced dorsal and anal rays, and moderate scales, by which the species may be known. East Indies. Not previously reported from Oceania.

Cypselurus nigripennis (Valenciennes).

Exocoetus nigripennis Valenciennes: Hist. nat. Poiss., vol. 19, p. 78, 1846 (type loc., China Seas).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).

—Bleeker: Atlas ichth., vol. 6, p. 70, pl. (5) 251, fig. 1, 1866-72 (New Guinea).

Head 3 7/8; depth 4 3/4; D. II, 10; A. II, 6; P. I, 16; scales 35 from gill opening to caudal base and 4 more on latter; 29 predorsal scales to maxillary; snout 4 in head from upper jaw tip; eye 2 1/2; maxillary 3 4/5; interorbital 2 1/6.

Body broad, robust forward, especially head. Least depth of caudal peduncle 2 3/5 in head. Snout short, obtuse or profile well inclined, length in profile about 2/5 its width. Eye large, strongly impinging on upper profile anteriorly. Maxillary oblique, only lower border narrowly exposed from preorbital sheath, end extends slightly beyond front eye edge, though not quite to pupil. Teeth very fine, in narrow bands in jaws. Lower jaw slightly protrudes, rami little elevated inside mouth. Nasal cavity small, close before middle of front eye edge. Interorbital concave. Gill opening forward opposite front eye edge. Gill rakers 6+15, lanceolate, 1 1/6 in gill filaments, which half of eye. Scales all fallen. Anal begins little behind dorsal origin, rays rather long and fins elevated, though not reaching caudal. Pectoral reaches opposite bases of hind dorsal rays. Ventral inserted slightly nearer caudal base than hind eye edge.

Largely slaty brownish. Fins all dusky and paired fins with several broad transverse variable black obscure bands. Caudal pale. Iris slaty.

One in the Bishop Museum from Shortland Island, Solomon Islands, received from Alvin Seale. Length 98 mm. (caudal broken).

Zanzibar and Madagascar to China Seas and New Guinea.

Cypselurus simus (Valenciennes).

Exocoetus simus Valenciennes: Hist. nat. Poiss., vol. 19, p. 77, 1846 (type loc., Hawaiian islands).—Günther: Rept. voyage "Challenger," vol. 31, pt. 2, p. 37, 1888 (1889) (Honolulu).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 369, 1909 (Hawaiian islands).

Cypsilurus simus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 435, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 522, 1902 (1904) (Honolulu; Kauai; Molokai).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 134, fig. 46, 1903 (1905) (Honolulu).—Nichols: Am. Mus., Novit., no. 94, p. 3, Oct. 19, 1923 (Marutea, Tuamotu Archipelago).

Cypselurus simus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 15, 1919 (Honolulu).—Fowler: Copeia, no. 122, p. 82, Nov. 20, 1922 (Hawaii).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 9, 1925 (Lahaina, Maui; Johnston Island).

? *Exocoetus unicolor* (part) Valenciennes: Hist. nat. Poiss., vol. 19, p. 70, 1846 (Vanicolo).

Exocoetus neglectus Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 512, 1901 (Honolulu).

Cypsilurus quindecimradiatus (non Fowler) Jordan and Seale: (U.S.) Bur. Fish., Bull., vol. 25, p. 210, fig. 15, 1905 (1906) (southward of Samoa).

Cypsilurus ogilbyi (Jordan and Snyder) Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 604, fig. 1, 1909 (type loc., west of Walpole Island, nearest land New Hebrides).

Exocoetus ogilbyi Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 371, 1909 (copied).

Head 4 to 4 1/4; depth 5 1/2 to 6; D. I, 11 or 12; A. I, 7 to 9; scales 55 or 56 from shoulder to caudal base and 5 more on latter; 33 or 34 predorsal scales; snout 3 1/3 to 3 4/5 in head measured from upper jaw tip; eye 3 1/4 to 3 2/5; maxillary 4; interorbital 2 1/5 to 2 1/2. Gill rakers 8+15, lanceolate, short or about 3 to 3 1/4 in eye, 1 3/4 in gill filaments. Scales with 4 basal radiating striae, sometimes 2 or 3 imperfect auxiliaries, edge scalloped; circuli very fine. Anal begins below middle or little before middle of dorsal base. Pectoral reaches base of last dorsal ray. Ventral inserted slightly nearer caudal base than hind eye edge. Brown above, paler to whitish below. Fins uniform pale. Upper outer portions of pectoral pale brown.

One in the Bishop Museum from Honolulu, 337 mm. One from Tahiti, 278 mm. Also 1 from off Lahaina, Maui in June and 1 from Johnston Island, both in 1923. In the National Museum 7 from Honolulu. One in the Academy from T. D. Wood, obtained at Honolulu in 1898. Length 330 mm.

In the description by Jordan and Evermann the scales are given as 43 to base of caudal. Their figure shows the lateral line with 48 tubular scales to the caudal base and 2 more on the latter; in the median lateral series from the gill opening 46 to the caudal base and 2 more on the latter. *Cypsilurus ogilbyi* is said to have 50 scales in a lateral series, which appears correct according to the figure, and as it has no other points of difference is here placed as a synonym. Moreover Jordan and Evermann's figure, mentioned above, varies markedly in having but five branched anal rays, though the description gives the anal rays as 8. Jordan and Seale's figure of *Cypsilurus quindecimradiatus* likely is this species. It shows the following: D. I, 13; A. I, 10; scales in median lateral series 59.

Melanesia, Hawaii.

Cypselurus spilurus (Günther).

Exocoetus spilurus Günther: Cat. fishes Brit. Mus., vol. 6, p. 285, 1866 (no type locality).

Cypsilurus spilurus Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 128, figs. 1 to 3, 1926 (east Long Island, New Guinea).

Head and depth equal, former short and thick; D. 11; A. 8; snout very short; eye very large; single flat barbel at chin, half long as head; interorbital wide, concave. Dorsal moderately elevated, last rays reach caudal. Pectoral reaches ventral base. Ventral inserted midway between head and caudal base, fin reaches caudal. Above transparent, colorless, below brown. Small black spot at base of mental barbel and larger one in middle of ventral root. Upper part of gill opening black. Pectoral colorless, with triangular black spot at base. Anal and ventral black. Length 63 mm. (Günther)

CORYPHAENOIDIDAE

Bathygadus micronema (Gilbert).

Melanobranchus micronema Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 661, fig. 258, 1903 (1905) (type loc., Pailolo Channel between Maui and Molokai in 753 to 787 fathoms).

Orbit more than 2/3 interorbital width. Barbel small. Gill rakers 35 on lower branch of first arch. First dorsal, pectoral and ventral each with filamentous ray longer than head. Length 235 mm. (Gilbert and Hubbs)

Bathygadus bowersi (Gilbert).

Gadomus bowersi Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 659, fig. 257, 1903 (1905) (type loc., Bird Island in 313 to 800 fathoms; Kauai in 313 to 876 fathoms).

Differs from *B. micronema* in the orbit less than 2/3

the interorbital width, no barbel, gill rakers 22 to 24 on lower branch of first arch and fins without filaments Length 465 mm. (Gilbert)

Type in the National Museum.

Gadomus melanopterus Gilbert.

Gadomus melanopterus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 658, fig. 256, 1903 (1905) (type loc., Kauai Island in 444 to 557 fathoms).

Interorbital wide as eye. Mandibular barbel long as maxillary. Gill rakers 27 on lower branch of first arch. First dorsal, pectoral and ventral each with long filament longer than head. Length 273 mm. (Gilbert)

Coryphaenoides ectenes (Gilbert and Cramer).

Macrourus ectenes Gilbert and Cramer: U. S. Nat. Mus., Proc., vol. 19, p. 423, pl. 44, fig. 1, 1897 (type loc., Hawaiian islands in 313 fathoms).—Gilbert; U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 667, 1903 (1905) (copied).

D. I, 10; P. 22; V. 9; orbit 2 2/5 in head; maxillary to front of pupil; barbel scarcely half of eye; interorbital 1 3/5 in orbit; 10 or 11 scales above lateral line. Brownish black. Length 140 mm. (Gilbert and Cramer)

Coryphaenoides habenatus (Gilbert).

Macrourus habenatus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 671, fig. 262, 1903 (1905) (type loc., off Oahu in 299 to 323 fathoms).

D. II, 12; P. 24; V. 8; orbit 2 7/8 in head; maxillary not quite to front pupil edge; interorbital 1 1/5 in eye; 11 scales above lateral line. Grayish. Length 125 mm. (Gilbert)

Differs from *Coryphaenoides ectenes* in much smaller eye, fin rays, smooth rostral tubercles, armature of scales and color.

Coryphaenoides propinquus (Gilbert and Cramer).

Macrourus propinquus Gilbert and Cramer: U. S. Nat. Mus., Proc., vol. 19, p. 424, pl. 42, fig. 2, 1897 (type loc., Hawaiian islands in 313 to 315 fathoms).—Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 667, 1903 (1905) (Kauai in 286 to 476 fathoms).

D. I, 13; P. 21 or 22; V. 16; orbit 3 to 3 1/3 in head; maxillary nearly to middle of pupil; barbel 1 1/2 in orbit; interorbital 1 1/4 to 1 1/3 in orbit; 14 scales above lateral line. Brownish. Length 190 mm. (Gilbert and Cramer).

In the National Museum a series of Hawaiian specimens.

Coryphaenoides holocentrus (Gilbert and Cramer).

Macrourus holocentrus Gilbert and Cramer: U. S. Nat. Mus., Proc., vol. 19, p. 425, pl. 43, 1897 (type loc., Hawaiian islands in 351 to 375 fathoms).—Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 668, 1903 (1905) (off Oahu in 308 to 322 fathoms).

D. I, 11 or 12; P. 20 or 21; orbit 3 1/3 in head; maxillary not quite to pupil center; barbel scarcely over 1/3 of orbit; interorbital 1 1/2 in orbit; 9 or 10 scales above lateral line. Light brownish. Length 190 mm. (Gilbert and Cramer)

Coryphaenoides burragei (Gilbert).

Macrourus burragei Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 668, fig. 260, 1903 (1905) (type loc., Oahu in 294 to 330 fathoms).

D. II, 10; P. 20 or 21; V. 9; eye 3 1/3 in head; maxillary scarcely to pupil front; barbel 7/10 of orbit; interorbital 4/5 of orbit; 14 scales above lateral line. Light gray. Length 265 mm. (Gilbert)

Differs from *Coryphaenoides holocentrus* in the deeper body, blunter anterior profile, larger first dorsal, shorter abdomen and much smaller scales.

Coryphaenoides gibber (Gilbert and Cramer).

Macrourus gibber Gilbert and Cramer: U. S. Nat. Mus., Proc., vol. 19, p. 426, pl. 44, fig. 2, 1897 (type loc., Hawaiian islands in 351 to 375 fathoms).—Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 668, 1903 (1905) (off Molokai; Kauai; Hawaii; Kaiwi Channel; Bird Island; in 253 to 800 fathoms).

D. I, 11 or 12; P. 20; V. 12 or 13; orbit 3 1/5 to 3 2/5 in head; maxillary scarcely to pupil front; barbel 1 to 1 1/2 in orbit; interorbital nearly equals orbit; 14 scales above lateral line. Brownish. Length 217 mm. (Gilbert and Cramer)

In the National Museum a series of Hawaiian specimens.

Coryphaenoides obliquatus (Gilbert).

Macrourus obliquatus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 670, fig. 261, 1903 (1905) (type loc., off Kauai in 437 to 632 fathoms).

D. II, 11; P. 22 or 23; V. 12; orbit 3 in head; maxillary scarcely reaching hind pupil edge; interorbital 7/10 of orbit; 9 scales above lateral line. Grayish. Length 155 mm. (Gilbert)

Coryphaenoides longicirrhus (Gilbert).

Macrourus longicirrhus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 672, fig. 263, 1903 (1905) (type loc., vicinity of Kauai Island in 1000 to 1314 fathoms).

D. II, 10; P. 21; V. 11; orbit 5 in head; maxillary reaches eye center; barbel nearly long as eye; interorbital greater than eye; 6 scales above lateral line. Dark or purplish brown. Length 590 mm. (Gilbert)

Coelorhynchus gladius Gilbert and Cramer.

Coelorhynchus gladius Gilbert and Cramer: U. S. Nat. Mus., Proc., vol. 19, p. 421, pl. 41, fig. 3, 1897 (type loc., Hawaiian islands at Station 3472 in 295 fathoms).—Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 673, 1903 (1905) (off Oahu; Kauai; in 192 to 352 fathoms).

D. I, 10 or 11; P. 18; V. 7; orbit 4 3/4 in head; maxillary to or little beyond middle of orbit; barbel minute, 3 1/2 to 4 in orbit; interorbital nearly equals orbit; 6 or 7 scales above lateral line. Light brownish. Length 171 mm. (Gilbert and Cramer)

Coelorhynchus aratrum Gilbert.

Coelorhynchus aratrum Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 674, fig. 264, 1903 (1905) (type loc., off Oahu in 289 to 337 fathoms; Pailolo Channel in 297 to 306 fathoms).

Coelorhynchus parallelus (non Günther) Gilbert and Cramer: U. S. Nat. Mus., Proc., vol. 19, p. 421, 1897 (Hawaiian islands, in 313 fathoms).

D. II, 8; P. 18 or 19; V. 7; orbit 3 3/4 in head; maxillary not quite to hind pupil edge; barbel half long as pupil; 5 scales above lateral line. Light brown above, whitish beneath. Length 313 mm. (Gilbert)

In the National Museum 3 Hawaiian specimens, including type of *Coelorhynchus aratrum*.

Coelorhynchus doryssus Gilbert.

Coelorhynchus doryssus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 675, pl. 94, 1903 (1905) (type loc., Kaiwi Channel in 9 to 44 fathoms; Kauai; Oahu in 192 to 449 fathoms).

D. II, 7; P. 17; V. 7; orbit 4 2/5 in head; maxillary to hind pupil edge; barbel half of pupil; 5 scales above lateral line. Light gray. Length 345 mm. (Gilbert)

In the National Museum 3 Hawaiian specimens, including the type.

Differs from *Coelorhynchus aratrum* in the more slender convex snout, larger mouth, head

scales minutely spinous and body scales much less strongly spinous.

Malacocephalus hawaiiensis Gilbert.

Malacocephalus hawaiiensis Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 677, fig. 265, 1903 (1905) (type loc., off Oahu in 304 to 315 fathoms; Pailolo Channel; Bird Island; Kauai; Maui; Oahu; in 165 to 684 fathoms).

Malacocephalus laevis (non Linné) Gilbert and Cramer: U. S. Nat. Mus., Proc., vol. 19, p. 432, 1897 (Hawaiian islands in 295 to 351 fathoms).

D. II, 11 or 12; P. 19 or 20; V. 9; orbit 3 in head; maxillary reaches slightly behind hind pupil edge; interorbital 3 in head; barbel half or little more than half in orbit; scales very small. Olive brown. Length 360 mm. (Gilbert)

In the National Museum a series of Hawaiian specimens.

Ventrifossa atherodon (Gilbert and Cramer).

Optomurus atherodon Gilbert and Cramer: U. S. Nat. Mus., Proc., vol. 19, p. 431, pl. 46, fig. 1, 1897 (type loc., Hawaiian islands in 298 to 343 fathoms).—Gilbert: U. S. Fish Com., Bull., vol. 23, pt. 2, p. 663, 1903 (1905) (Pailolo Channel; off Oahu; Bird Island; Kauai; off Hawaii; Maui; Kaiwi Channel; in 165 to 513 fathoms).

D. I, 10 or 11; P. 20 to 23; V. 10; orbit 3 1/4 in head; maxillary reaches middle of orbit; barbel little over half of orbit; mandibular teeth biserial; interorbital 1 1/4 to 1 1/2 in orbit; 10 to 12 scales above lateral line. Brownish above, sides silvery, below bluish black. Length 343 mm. (Gilbert and Cramer)

In the National Museum a large series of Hawaiian specimens.

Ventrifossa ctenomelas (Gilbert and Cramer).

Chalinura ctenomelas Gilbert and Cramer: U. S. Nat. Mus., Proc., vol. 19, p. 430, pl. 45, fig. 2, 1897 (type loc., Hawaiian islands at Stations 3470 and 3472 in 295 to 343 fathoms).—Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 662, 1903 (1905) (Pailolo Channel; off Oahu; Kauai; in 225 to 368 fathoms).

D. I, 10 to 12; P. 21; V. 9 or 10; orbit 2 3/4 to 3 in head; maxillary nearly reaches hind pupil edge; barbel 1 to 1 1/3 in orbit; interorbital 1 1/2 in orbit; 10 scales above lateral line. Brown above, sides silvery, below blackish. Length 203 mm. (Gilbert and Cramer)

Differs from *V. atherodon* in the lower narrow band of teeth and more spinulose scales.

In the National Museum a series of Hawaiian specimens.

Hymenocephalus antraeus Gilbert and Cramer.

Hymenocephalus antraeus Gilbert and Cramer: U. S. Nat. Mus., Proc., vol. 19, p. 428, pl. 46, fig. 2, 1897 (type loc., Hawaiian islands in 298 to 343 fathoms).—Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 663, 1903 (1905) (Pailolo Channel; Oahu; Kauai; Maui; in 256 to 437 fathoms).

D. I, 9 to 11; P. 13 to 16; V. 12; orbit 2 2/3 in head; maxillary reaches beyond hind eye edge; interorbital 3 1/3 to 3 2/3 in head; 5 scales above lateral line. Dark brown. Length 178 mm. (Gilbert and Cramer)

A series of Hawaiian specimens in the National Museum, including the types.

Hymenocephalus striatulus Gilbert.

Hymenocephalus striatulus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 665, fig. 259, 1903 (1905) (type loc., southwest of Oahu in 192 to 352 fathoms; Kauai in 55 to 362 fathoms).

D. II, 9 to 11; P. 15 to 18; V. 14 or 15; orbit 3 in head; maxillary reaches hind eye edge; barbel usually obsolete; interorbital 4 1/5 in head; 4 scales above lateral line. Light olive, dark below. Length 44 mm. (Gilbert)

In the National Museum 6 Hawaiian specimens.

Differs from *Hymenocephalus antraeus* in the more slender body, smaller eye, more projecting snout, more spinous scales and more numerous ventral rays.

Hymenocephalus aterrimus Gilbert.

Hymenocephalus aterrimus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 666, pl. 93, 1903 (1905) (type loc., near Kauai Island in 385 to 500 fathoms; off Molokai; Kaiwi Channel; Bird Island; Niihau; in 293 to 800 fathoms).

D. II, 9; P. 13 or 14; V. 13 or 14; orbit 4 1/2 in head; maxillary reaches beyond hind eye edge; 4 scales above lateral line. Uniform black. Length 185 mm. (Gilbert)

Differs from *H. striatulus* in the deeper body, sensory head canals excessively developed and absence of barbel.

Metaeocephalus acipenserinus (Gilbert and Cramer).

Coelocephalus acipenserinus Gilbert and Cramer: U. S. Nat. Mus., Proc., vol. 19, p. 422, pl. 42, fig. 1, 1897 (type loc., Hawaiian islands in 298 to 375 fathoms).

Metaeocephalus acipenserinus Gilbert: U. S. Fish Comm., Bull., 23, pt. 2, p. 676, 1903 (1905) (Molokai; Oahu; Bird Island; Kauai; Maui; Pailolo Channel; in 222 to 498 fathoms).

D. I, 10 or 11; P. 22 to 24; V. 8 or 9; orbit 3 1/3 to 3 3/4 in head; maxillary reaches eye center; barbel 5 in orbit; 7 scales above lateral line. Light brownish. Length 184 mm. (Gilbert and Cramer)

In the National Museum a large series of Hawaiian specimens, including the types of *Coelocephalus acipenserinus.*

Trachomurus sentipellis Gilbert and Cramer.

Trachomurus sentipellis Gilbert and Cramer: U. S. Nat. Mus., Proc., vol. 19, p. 429, pl. 4, fig. 1, 1897 (type loc., Hawaiian islands in 375 fathoms).—Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 679, 1903 (1905) (Kauai; Kaiwi Channel; in 418 to 804 fathoms).

D. I, 8; P. 16 or 17; V. 7; orbit 3 3/5 in head; maxillary reaches little beyond middle of eye; barbel 2 2/3 in orbit; interorbital little greater than eye; 8 scales above lateral line. Dark brown, darker anteriorly. Length 293 mm. (Gilbert and Cramer)

In the National Museum 5 Hawaiian specimens.

BREGMACEROTIDAE

Bregmaceros mcclellandii Thompson.

Bregmaceros mcclellandii (Cantor) Thompson: Loudon Mag. Nat. Hist., Charlesworth, vol. 4, p. 184, fig., 1840 (type loc., brackish water of Gangetic Delta).—Weber: Siboga Exped., vol. 65, 1913, p. 174 (Waigiu).

Fusiform, compressed posteriorly. Minute movable teeth round margin of mouth and on vomer, none on palatines. Vent at end of anterior third in total length. Scales 64. D. 1-16, 15; A. 22, 20; occipital dorsal ray very slender, longer than head; dorsal and anal depressible backward in groove formed by basal scales; median dorsal and anal rays very short and feeble; 3 outer ventral rays dilated, compressed, simple, reach middle of

anal base. Silvery, minutely dotted with brown. (Günther)

India, East Indies, China.

GADIDAE

Antimora microlepis Bean.

Antimora microlepis Bean: U. S. Nat. Mus., Proc., vol. 13, p. 38, 1890 (type loc., off Cape St. James, Queen Charlotte Islands in 876 fathoms).—Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 656, 1903 (1905) (Kauai, in 1000 to 1314 fathoms).

Head 3 3/5; depth 4 4/5; D. 4-51; A. 38; scales 130; snout 3 1/3 in head; orbit 4; maxillary 2 1/10; barbel 11 1/10; interorbital 3 4/5; teeth in narrow bands on jaws, and small cluster on head of vomer; gill rakers 3 + 11, very short. Light gray. Gill membranes, pectorals, ventrals and caudal deep blue. Lining of gill cavity and abdominal wall black. Length 465 mm. (Gilbert)

Off British Columbia and Hawaii.

Laemonema rhodochir Gilbert.

Laemonema rhodochir Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 657, fig. 255 1903 (1905) (type loc., off Oahu in 53 to 211 fathoms).

Head 4; depth 5 1/5; D. 5-64; A. 59; scales 130, 16 or 12 above; snout 4 1/5 in head; eye 3 4/5; maxillary to hind pupil edge; gill rakers 5+11. Light brownish. Belly pale blue. Dorsal and anal dusky, with submarginal black streak, margin white; terminal half of anterior dorsal ray white. Caudal largely black. Pectorals orange red, axil blackish. Ventrals white. Length 116 mm. (Gilbert)

Physiculus kaupi Poey (Pl. IV, *A*).

Physiculus kaupi Poey: Repert. fiscico-nat. Cuba, p. 186, 1865 (type loc., Cuba).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 10, no. 7, p. 392, 1923 (Honolulu).

Physiculus grinnelli Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 7, p. 22, pl. 1, fig. 3, Dec., 1922 (type loc., Honolulu).

Head 3 3/4 to 3 4/5; depth 4 1/5 to 4 4/5; D. VII. 69 to 74; A. 65 to 69; scales 128 in lateral line to caudal base and 8 more on latter; 15 scales above lateral line to spinous dorsal origin, 38 below; 50 predorsal scales; snout 3 2/3 in head; eye 5; maxillary 2; interorbital 4 1/2. Least depth of caudal peduncle 8 1/5 in head. Head width 2 in its length. Third dorsal spine 3 in head; third dorsal ray 3 1/2; thirteenth anal ray 4; caudal 2 1/2; pectoral 1 3/4; ventral 1 3/5.

The Bishop Museum has 3 from Honolulu, largest 317 mm. They agree in most respects with Günther's account of *Physiculus kaupi* from Inosima, Japan (Rept. Voyage "Challenger," vol. 22, p. 88, pl. 17, fig. A, 1887) taken in 345 fathoms depth. His specimens were 278 to 405 mm. long, with dorsal IX or X, 60 to 66, and anal 60 to 70. His figure shows a slightly larger head and shorter ventrals, also there are no very distinct dark edges to the vertical fins and the blackish chin and branchiostegals are not so contrasted as in my specimens.

LOPHOTIDAE

Lophotes capellei Schlegel.

Lophotes capellei Schlegel: Fauna Japonica, Poiss., pts. 7-9, p. 132, pl. 71, fig. 2, 1845 (type loc., Japan).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 392, 1923 (Laysan Island).

Lophotes cepedianus (non Giorna) Günther: Rept. voyage, "Challenger," vol. 31, pt. 2, p. 19, pl. 2, figs. k-k'; 1888 (1889) (Admiralty Islands to Japan).

Head 7 1/2, from snout tip; depth 7 1/4; D. about 235?; A. III, 16; P. II, 15; V. 5; snout 3 2/5 in head measured from upper jaw tip; eye 3 3/4; maxillary 3 1/4; mandible 3 1/8; interorbital 4 4/5.

Body extremely compressed, thin, anterior half more or less uniformly deep and only gradually and moderately tapering to anal; greatest depth about pectoral origin. Caudal peduncle small, compressed, not free above from caudal, least depth about 2 1/5 in its length as measured along lower edge or 6 2/3 in head measured from upper jaw tip.

Head strongly compressed, sides greatly flattened, depth very slightly less than length as measured from snout tip; head width 3 1/2. Snout with profile sloping inward, width 1 1/5 in its length. Eye large, upper pupil edge midway in head depth and hind eye edge midway in head length from snout tip. Mouth transversely horizontal, gape very short and closed lower jaw very slightly protruding beyond upper. Maxillary with upper edge slipping below narrow preorbital most its length; reaches beyond front eye edge though not quite to front pupil edge; expansion half of eye. Teeth simple, conic, in 3 or 4 irregular series in front of each jaw, where also largest. Several small similar teeth on vomer and few on each palatine. Inner buccal folds broad. Tongue rather pointed, depressed, smooth, free in front. Nostril small pore each side of snout tip, or near first fourth of snout in profile. Interorbital greatly elevated and produced forward in profile as high rounded median keel, like a prow, its front edge narrowly trenchant. Opercle, preopercle, subopercle and interopercle all with fine radiating striae.

Gill opening forward opposite front pupil edge. Gill rakers 4+8, lanceolate, longest 1 3/4 in gill filaments, which 1 3/4 in eye. Pseudobranchiae well developed, about 4/5 of gill filaments. Isthmus narrow, contracted until very slender anteriorly.

Body covered with extremely thin, papery, caducous scales, each more or less oblong or ellipsoid, with fine longitudinal (horizontal) parallel striae; under a lens each seen to have row of dark dots like pigment cells along every fifth or more of grooves. Scales very feeble and easily rub off so that only few now left about thorax. Lateral line begins well upon side of frontal crest, thence to shoulder and its greater course straight and median along side.

Dorsal begins as enlarged compressed spine (damaged) on frontal crest, followed by a few weak flexible spines rapidly graduated down until lowest about front of eye much less than pupil; then rays graduated up until over pectoral where reaching their greatest height, backward from this point gradually lower until confluent with caudal; fifteenth ray 3 9/10 in head measured from upper jaw tip. Anal entirely posterior, slightly before last fourteenth between snout tip and caudal base, fin small and rounded. Caudal broken off. Pectoral vertical in position, its base at lowest fifth in greatest body depth, 2 in head. Ventral very small, rudimentary, little lower and close behind pectoral base. Genital pore half an eye diameter before anal, vent closer to genital pore than to anal.

Color in alcohol silvery-gray generally. Neutral dusky tinge on muzzle, front of head, about isthmus and within gill opening. Iris pale slaty. Fins all pale.

One in the Bishop Museum, 450 mm. measured from frontal crest-tip to caudal base. Obtained by Max Schlemmer in August 1907 at Laysan Island. It seems to agree with Goode and Bean's account except they state that the "body absolutely naked." Günther figures a

young specimen with the caudal and dorsal fins confluent. Though this is the alleged character for the distinction of the present species from *Lophotes cepidianus,* likely in the young of both it is confluent.

Pelagic.

LAMPRIDAE

Lampris regius (Bonnaterre) (fig. 17).

Zeus regius Bonnaterre: Tableau ichth., p. 72, pl. 39, fig. 155, 1788 (type loc., Torbay) (on Pennant).

Lampris regius Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 166, 1903 (1905) (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 29, Dec. 1922 (Honolulu).

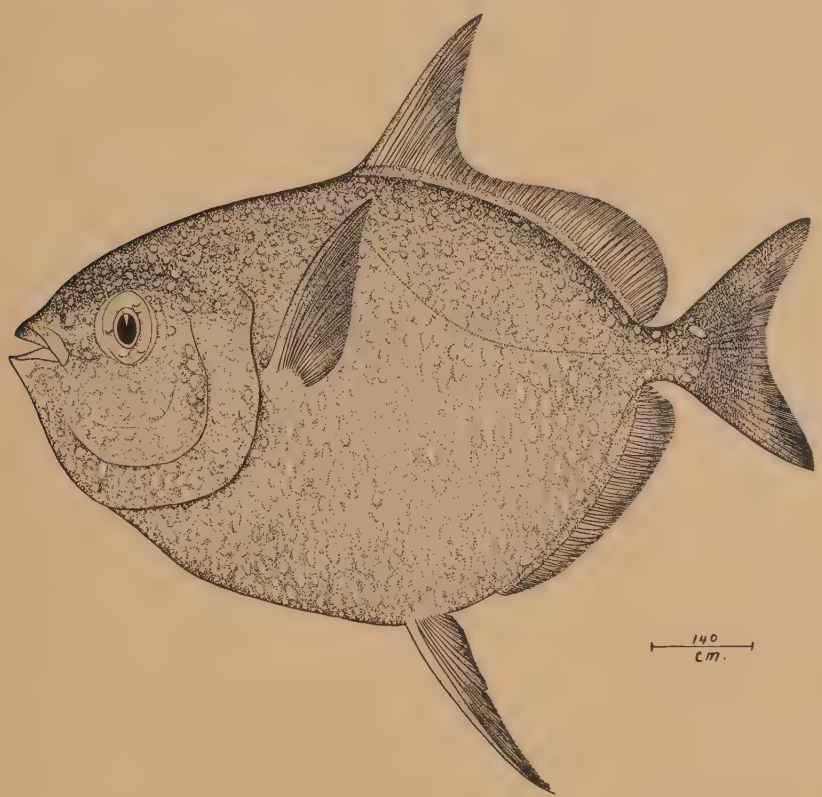

FIGURE 17.—Drawing of *Lampris regius.*

Head 2 3/5; depth 1 1/2; D. 1, 51; A. 11, 40; P. 1, 18; V. 1, 13; snout 2 5/6 in head measured from upper jaw tip; eye 4 3/5; maxillary 3 1/2; interorbital 2 3/4.

Body deeply ovoid, strongly compressed with deep flattened sides and deepest at dorsal origin. Least depth of caudal peduncle 5 1/3 in total head length. Head large, deep, sides flattened, width 2 in its length. Snout conic, long as wide. Eye deep, center about midway in head length. Mouth small, terminal, with mandible slightly protruding and ending in symphyseal point. No teeth. Upper inner buccal fold rather narrow, lower scarcely developed. Tongue slender, pointed surface level, smooth, free in front. Maxillary slips below moderate preorbital, extends 2/3 to eye; expansion 3 in vertical eye diameter. Nostrils small, well separated, front one slightly nearer eye than snout tip and larger than posterior, which close before eye. Interorbital evenly convex. Preopercle entire, flange very wide. Gill opening extends forward opposite front nostril. Gill rakers 17, slender, lanceolate, 1 2/3 in gill filaments, which 2 in snout. Head and anterior half of body largely naked, rest of trunk and bases of vertical fins all densely scaly; few small scales on upper part of opercle. Lateral line strongly arched as loup toward dorsal lobe, then down along upper side of back to middle of caudal peduncle side; tubes all simple, slender, well exposed on anterior scales. Scales with 1 or 2 basal radiating striae; apical edges all irregular, uneven, ragged; circuli uneven, fine. Dorsal fin begins midway in back, front lobe falcate, 1 2/3 in dorsal base, 1 1/3 in head. Anal begins just behind dorsal lobe in vertical, rays sloping up to hind ones, which longest. Caudal widely emarginate, lobes pointed and even. Pectoral nearly vertical, slightly less than half of body depth, 1 1/6 in head. Ventral long, begins below dorsal lobe, similar, fin 1 1/6 in head. Vent close before anal.

Faded dull brownish generally, back darker. Sides and lower surface with numerous close-set whitish spots, some as short bars and blotches and more crowded on sides below.

The specimen described, 1185 mm. long, is in the Bishop Museum. It was caught in deep water 13 miles off Waianae beach, Oahu, by Japanese fishermen, March 10, 1922.

PLEURONECTIDAE
BOTHINAE

Arnoglossus aspilos (Bleeker).

Rhombus aspilos Bleeker: Nat. Tijds. Ned. Ind., vol. 1, p. 408, 1850 (type loc., Batavia).

Arnoglossus aspilus Günther: Rept. voyage "Challenger," vol. 1, p. 47, 1880 (Arafura Sea in 30 fathoms).

Head 4; depth 2 1/3; D. 80 to 82; A. 61 to 63; scales 45; lower eye advanced, 4 in head; lower jaw

prominent; maxillary 2 1/2 in head; interorbital less than half of eye. Brownish gray. Length 76 mm. (Günther)

East Indies.

Arnoglossus intermedius (Bleeker).

Platophrys intermedius Bleeker: Nederlandsch Tijds. Dierk., vol. 3, p. 47, 1866 (type loc., Menado, Celebes).

Head 3 1/2; depth 2; D. 79; A. 57; scales 54 in lateral line to caudal base and 3 more on latter; 9 scales above lateral line, 16 below; snout 3 2/5 in head measured from upper jaw tip; eye 5 2/5; maxillary 2 1/3; interorbital 2 in eye.

Contour rather evenly ellipsoid, deepest midway, upper profile slightly indented just before eyes. Least depth of caudal peduncle 2 in total head length. Head width 3 4/5 in its length. Snout strongly compressed. Eyes close, lower slightly advanced. Maxillary curved, nearly vertical, expansion 1 1/4 in eye. Mandible strongly compressed, deep, slightly protrudes. Teeth fine, uniserial, less developed on right side. Interorbital with slight median channel. Gill rakers 0+IX, low asperous tubercles, 1/3 of gill filaments, which 1 1/2 in upper eye. Scales of left side with 65 to 80 basal radiating striae; apical denticles 50 to 53, with 1 or 2 more series of minute ones; of right side cycloid, basal radiating striae 50 or 51. First dorsal ray much longer than others anteriorly, though few closely following also free terminally; first 3 in total head length, thirtieth 2 1/3; thirtieth anal ray 2 1/5. Caudal rounded behind, 1 1/3 in head. Pectoral small, 2 in head. Ventral with rather long base.

Color in alcohol faded dull brown generally on left side, mottled with darker and 4 or 5 rows of darker blotches, ringed with dusky-brown. Dorsal, anal, caudal and ventral with rather scattered dusky specks. Right side whitish. Length 109 mm.

One in the Bishop Museum from Shortland Island, Solomon Islands, obtained by Alvin Seale in 1903.

This species, not previously reported from Oceania, is characterized by the long first dorsal ray.

Arnoglossus macrolophus Alcock.

Arnoglossus macrolophus Alcock: Asiat. Soc. Bengal, Jour., vol. 58, p. 280, 1889 (type loc., five miles south of Ganjam in 25 fathoms).—Weber: Siboga Exped., Fisch., vol. 65, p. 432, 1913 (near Waigiu).

Head 4 1/2; depth 3; D. 88 to 90; A. 67; scales 55; eyes opposite, 3 3/4 in head; mouth very oblique; maxillary reaches pupil; interorbital very narrow ridge. Dull smoky brown, with circumferential row of ill-defined dark blotches just inside vertical fins and others along lateral line. Ventral nearly black. Left pectoral with transverse black band in posterior half. Length 87 mm. (Alcock)

Distinguished by having anterior dorsal rays elongated more than half length of entire fish.

India, East Indies.

Taeniopsetta ocellatus (Günther).

Pseudorhombus ocellatus Günther: Rept. voyage "Challenger," vol. 1, p. 56, 1880, pl. 24, figs. A-B, 1880 (type loc., outside Nares Harbor, Admiralty Islands, in 152 fathoms).

Taeniopsetta radula Gilbert : U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 680, fig. 266, 1903 (1905) (type loc., Pailolo Channel between Molokai and Maui in 128 to 138 fathoms; Laysan in 99 to 220 fathoms).

Head 3 4/5; depth 1 2/3; D. 88 to 93; A. 72 to 75; scales 140, pores 110 to 120; arch of lateral line 4 in straight section; gill rakers 5 rudiments, very short. Eyes nearly opposite. Dorsal begins opposite upper edge of lower eye. Some anterior dorsal and anal rays greatly elongated. Left side light olive brown, finely mottled and specked with darker brown. Series of brown rings along dorsal and ventral outlines and other scattered rings. Length 115 mm. (Gilbert)

Series of Hawaiian specimens in the National Museum.

Anticitharus debilis Gilbert.

Anticitharus debilis Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, 1903, p. 683, pl. 97, 1903 (1905) (type loc., Pailolo Channel between Molokai and Maui, in 132 to 141 fathoms; off Molokai; near Laysan Island; in 122 to 220 fathoms).

Head 3 7/8; depth 2 3/4; D. 112 to 117; A. 90 to 95; arch of lateral line 5 2/3 in straight section; gill rakers 0+10, short, slender; scales 94 to 98. Dorsal begins close behind nostril. Left side olive brown, finely freckled darker and sparsely spotted light. Vertical fin rays finely mottled, with oblong dark blotches at intervals of 10 to 15 rays. Length 173 mm. (Gilbert)

Ten Hawaiian specimens in the National Museum, including the type.

Platophrys mancus (Broussonet) (Pl. IV, *B*).

Pleuronectes mancus Broussonet: Ichth., Dec., 1782, no pagination, pl. (type loc., Ulietea, near Anamoka, Tahiti).

Platophrys mancus Smith and Swain: U. S. Nat. Mus., Proc., vol. 5, p. 142, 1882 (Johnston Island).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 17, p. 946, 1904 (Honolulu).—Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 684, 1903 (1905) (Honolulu; Pailolo Channel; between Maui and Lanai; Laysan Island; in 34 to 140 fathoms).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 86, 1906 (Rarotonga; Tubuai).—Jordan and Seale: (U.S.) Bur. Fish., Bull., vol. 25, p. 412, 1905 (1906) (Apia; Pago Pago).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 331, 1911 (Arhno, Marshalls; Fakarava and Makemo, Paumotus).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 24, December, 1922 (Hawaii).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 9, 1925 (Johnston and Wake islands).—Fowler: op. cit., 38, p. 21, 1927 (Tongareva).

Rhomboidichthys mancus Günther: Mus. Godeffroy, Jour., vol. 8, no. 16, p. 342, 1909 (Ulietea).

Rhombus macropterus Quoy and Gaimard: Voyage "Uranie," Zool., p. 236, pl. 50, 1824 (type loc., Iles des Papous; Rawak).

Pleuronectes rhombus (non Linné) Jouan: Soc. Cherbourg, Mem., vol. 8, p. 256, 1861 (Uitoë, New Caledonia).

Rhomboidichthys pavo Günther: Cat. fishes Brit. Mus., vol. 4, p. 435, 1862 (Aneiteum).

Platophrys pavo Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 128, 1900 (Guam).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 510, 1901 (Honolulu).—Steindachner: op. cit., vol. 1, pt. 5, p. 20, 1902 (Honolulu).

In *P. pantherinus* and *P. chlorospilus* the interorbital is greatly widened. In *P. pavo*, D. 98 to 100, A. 78 to 80, scales 90 to 95.

In the National Museum 2 Hawaiian specimens and 1 from Tuamotus, 58 to 265 mm., obtained by the Wilkes Expedition. Also largely through the Bureau of Fisheries 28 Hawaiian specimens, 1 Makemo, 1 Arhno, 1 Johnston Island. The Bishop Museum has 6 from Honolulu, 1 Palmyra through Thurston and Thaanum in 1922, 3 Johnston Island, 2 Wake Island, 1 Marcus Island, 1 Raiatea, 1

Rarotonga, 1 Makatea, and 2 from Agaña on Guam. Largest 456 mm. In the Agassiz Museum 12 from Apiang in the Gilbert Islands, through Andrew Garrett and 1 Fakarava.

Possibly *Pleuronectes spinosus* Schneider (Systema ichth. Bloch, p. 161, 1801, type loc., Pacific Ocean near Nanoeka Island) is really *Platophrys mancus*. Though apparently not noticed since originally described, it was later named *Pleuronectes pictus* (Forster) by Lichtenstein (Descriptiones animalium, p. 285, 1844, type loc., Nanoeka Island, New Caledonia) who gives the following items in condensed form:

D. 93; A. 78; P. 12. Body sinistral, ovate, compressed, smooth. Snout short, compressed. Eyes well separated. Mouth small, arched. Maxillary small. Scales medium, rounded, imbricated. Whole head and anterior rays in fins scaly. Fin rays in front extended into white bristles. Left side brown, tinged yellow and green, with irregular spots, scattered, with paler, bordered with blue, larger blotches dotted with brown medially; whole remaining part of body scattered with brown dots. Right side milky white with pale brownish spots.

Cocos Island, Indian Ocean, East Indies, Hawaii.

Platophrys thompsoni Fowler (Pl. IV, *C*).

Platophrys thompsoni Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 388, 1923 (type loc., Honolulu).

D. 86; A. 62; scales 132; gill rakers 6 + 14. Length 134 mm.

Known only from the type in the Bishop Museum.

Platophrys pantherinus (Rüppell).

Rhombus pantherinus Rüppell: Atlas Reis. Nord. Africa, Fisch., p. 121, pl. 3, fig. 1, 1828 (type loc., Mohila, Red Sea).

Rhomboidichthys pantherinus Günther: Cat. fishes Brit. Mus., vol. 4, p. 436, 1862 (Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 24, 1869 (Samoa).—Peters: Akad. Wiss. Berlin, Monastb., p. 844, 1876 (1877) (Bougainville Island).—Streets: United States Nat. Mus., Bull. no. 7, pp. 57, 59, 1877 (Honolulu, Fanning Islands).—Günther: Rept. voyage "Challenger," vol. 1, p. 61, 1880 (Honolulu).—Vaillant: Soc. Philom. Paris, Bull., 7th ser., vol. 11, p. 54, 1886-87 (Tahiti).—Pellegrin: Mus. Hist. Nat. Paris, Bull., vol. 4, p. 228, 1898 (Rota, Mariannes).—Waite: Australian Mus., Records, vol. 5, p. 3, 1903 (Nauru, Pleasant Island, Marshalls).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 342, 1909 (South Sea).

Platophrys pantherinus Ogilby: Linn. Soc. New South Wales, Proc., vol. 22, p. 770, 1897 (New Caledonia).—Waite: Australian Mus., Mem., no. 3, p. 546, 1899 (Funafuti, Ellice Islands).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 511, 1901 (Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 17, 1902 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 510, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 512, 1903 (1905) (Honolulu; Hilo).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 412, 1905 (1906) (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 332, 1911 (Kambora, Fiji; Fakarava and Makemo, Paumotus; Guam; Moen, Truk Group, Carolines; Namuka, Tonga Islands).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 134, 1913 (Saonek, Waigiu).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 24, Dec., 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 6, 23, 1925 (Guam, Honolulu).—Fowler: B. P. Bishop Mus., Bull. 38, p. 21, 1927 (Honolulu).

Passer marchionessarum Valenciennes: Voyage "Venus," Poiss., p. 344, pl. 9, 1850 (type loc., Marquesas Islands).

Pleuronectes lunulatus (non Bonaterre) Jouan: Soc. Cherbourg, Mem., vol. 8, p. 256, 1861 (Port de France and Kanala, New Caledonia; likely male).

Platophrys mancus (non Broussonet) Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 946, 1904 (Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 86, 1906 (Tahiti; Rarotonga; Makatea; Shortland Island).

D. 85 to 93; A. 65 to 70; scales 90 to 100.

This species never reaches so large a size as *Platophrys mancus*.

The National Museum has 3 without locality, likely Polynesian, 2 from Maui and 1 Hawaiian, 48 to 132 mm., obtained by the Wilkes Expedition. Also 2 from Honolulu through T. H. Streets, 1 Hawaii, 2 Samoa, 1 Fanning Island through Streets, 1 Kambara, 1 Makemo, 1 Guam, 1 Truck, 1 Papeete. The Bishop Museum has 20 from Honolulu, 1 Tahiti, 1 Shortland Island, 1 Rarotonga, 1 Makatea, 2 Agaña on Guam. Largest 200 mm. I examined 363 specimens in the Honolulu markets in November and December, 1922. In the Agassiz Museum 9 Hawaiian, of which 5 through W. H. Jones, 3 Society Islands through Andrew Garrett, 1 Tonga, 1 Ponapé through Rev. L. H. Gulick, 2 Kusaie through Rev. B. G. Snow, 3 Ebon Island through Rev. B. G. Snow, 1 Ascension Island, Marshall Islands, through Rev. A. A. Strong on April 14, 1877, 1 Fakarava. The Academy has 6 specimens from the Hawaiian islands, of which 1 from J. K. Townsend and 1 from Thomas Nuttall and labeled "Pacific Ocean." Length 83 to 143 mm.

Red Sea and Mauritius to East Indies, Tahiti and Samoa.

Platophrys chlorospilus Gilbert.

Platophrys chlorospilus Gilbert: U. S. Fish Comm., Bull., vol. 22, pt 2, p. 684, fig. 267, 1903 (1905) (type loc., off north coast of Maui in 78 to 85 fathoms).

Rhomboidichthys chlorospilus Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 343, 1909 (note).

Platophrys inermis Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 685, fig. 268, 1903 (1905) (type loc., Pailolo Channel, between Molokai and Maui in 122 to 132 fathoms; Laysan, north Maui and Pailolo Channel, in 99 to 173 fathoms).

D. 106 to 113; A. 86 to 94; scales 56 to 109; gill rakers 9 or 10. Length 183 mm. (Gilbert)

A series of specimens in the National Museum. I follow Günther in the inclusion of *Platophrys inermis* as a synonym.

Platophrys angustifrons (Günther).

Rhomboidichthys angustifrons Günther: Rept. voyage "Challenger," vol. 1, p. 46, pl. 21, fig. B 1880 (type loc., Arafura Sea in 30 fathoms).

Head 3 1/4; depth 1 2/3; D. 83; A. 62; scales 80; lower eye little advanced. Front dorsal rays nearly detached and produced. Light brown with indistinct darker spots, of which a series runs along dorsal and anal base. Also caudal ornamented by pair of similar spots, one close to upper and lower margin. Three large black ocelli, edged white with black outer ring, placed in middle of body in form of triangle. Length 140 mm. (Günther)

Platophrys coarctatus Gilbert.

Platophrys coarctatus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 686, fig. 269, 1903 (1905) (type loc., Pailolo Channel, between Molokai and Maui in 138 to 140 fathoms; Laysan Island; Maui, in 138 to 220 fathoms).

D. 114 to 121; A. 93 to 99; scales 93 to 96; gill rakers 10 on lower branch of first arch. Light olive brown, profusely covered with variable dark ringed green spots. Length 162 mm. (Gilbert)

Two types in the National Museum.

Platophrys constellatus Jordan and Goss.

Platophrys constellatus (Jordan) Jordan and Goss: U. S. Fish Comm., Rept., vol. 14, pp. 264, 266, 1886 (1889) (type loc., James Island, Galapagos).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 160, 1912 (Mangareva, Gambier Islands).

D. 89; A. 65; scales 75; arch of lateral line 6 in straight part. Dark brown with numerous stellate white spots, most distinct with darker edges. Fins mottled with dark brown, pectoral finely barred. Length 90 mm. (Jordan and Goss)

One in the National Museum from Mangareva.

Engyprosopon hawaiiensis Jordan and Evermann.

Engyprosopon hawaiiensis Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 207, 1902 (1903) (type loc., Hilo).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 514, fig. 227, 1903 (1905) (type).—Gilbert: op. cit., vol. 23, pt. 2, p. 687, 1903 (1905) (off Maui in 10 to 14 fathoms).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).

Head 3 3/4; depth 1 7/8; D. 82; A. 57; scales 40 in lateral line to caudal base and 2 more on latter; 12 scales above lateral line, 14 below; snout 4 1/8 in head measured from upper jaw tip; eye 3 1/3; maxillary 3; interorbital 3 1/2.

Gill rakers 0 + 8, conic, strong, short. Scales of colored or left side with 48 to 50 fine basal striae, finely parallel; apical denticles 54 to 60; circuli very minute; of right side 57 to 60 finely parallel basal striae. Right side finely specked or dotted with various dusky markings, vary to blackish, also extending on vertical fin rays and left pectoral. Length 77 mm.

One in the Academy from Maui. The type in the National Museum. Jordan and Evermann do not figure any of the color markings noted above, so their figure loses much of the extremely variegated appearance of the species.

Engyprosopon arenicola Jordan and Evermann.

Engyprosopon arenicola Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 207, 1902 (1903) (type loc., Hilo).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 515, pl. 62, 1903 (1905) (types).

Differs from *E. hawaiiensis* in the larger scales, 36 in lateral line. The figure, however, does not show the arch of the lateral line distinctly.

The type is in the National Museum, a specimen 64 mm. long. Probably not distinct from *Engyprosopon hawaiiensis*.

Scaeops spilura (Günther).

Rhomboidichthys spilurus Günther: Rept. voyage "Challenger," vol. 1, p. 47, pl. 21, fig. A, 1880 (type loc., south of New Guinea in S. Lat. 9° 59′, E. Long. 139° 42′ in 28 fathoms; Cebu).

Head 2 4/5; depth 1 3/4; D. 90; A. 66; scales 47; eye 4 in head; mouth narrow; maxillary equals eye; scales deciduous, scaly interorbital concave. Grayish, finely marbled brown. Caudal with pair of black median spots, each close to upper and lower edges. Length 126 mm. (Günther).

Scaeops xenandrus (Gilbert).

Engyprosopon xenandrus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 687, fig. 270, 1903 (1905) (type loc., off Molokai in 43 to 73 fathoms; Pailolo Channel; Avu Channel; Laysan; off Maui; Kauai; in 30 to 176 fathoms).

Head 3 3/5; depth 1 7/8; D. 79 to 91; A. 61 to 69; scales 50, 12 above; eyes widely separated and lower advanced, orbit 3 in head; jaws equal; maxillary but little beyond front of eye; interorbital equals orbit; 12 gill rakers on lower branch of first arch. Left side grayish, with blackish shadings and mottlings and 3 ill defined black spots along middle of sides. Gray interocular bar, bordered by blackish. Length 86 mm. (Gilbert)

Series of Hawaiian specimens in the National Museum.

Scaeops poecilurus (Bleeker).

Rhombus poecilurus Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 293, 1852 (type loc., Amboina).

Scaeops poecilurus Weber: Siboga Exped., vol. 65, p. 429, 1913 (West New Guinea in S. Lat. 1° 42′.5, E. Long. 130° 47′.5 in 32 m.)

D. 81 to 84; A. 59 to 63; scales 45; lower eye little advanced, 3 1/2 in head; interorbital less than eye. Brownish, dusted with deep olive brown. Length 83 mm. (Bleeker)

East Indies.

Laeops parviceps Günther.

Laeops parviceps Günther: Rept. voyage "Challenger," vol. 1, pp. 29, 49, pl. 15, fig. A, 1880 (type loc., Arafura Sea in S. Lat. 8° 56′, E. Long. 136°; southeast Australia; Twofold Bay, south Australia, in 35 to ? 120 fathoms).

Head 5 1/3; depth 2 2/3; D. 104; A. 86; eye 3 1/3; mouth directed upward, narrowly cleft; maxillary scarcely reaches eye; interorbital very narrow, lower eye advanced; arch of lateral line 7 in straight part. Uniform brown. Length 140 mm. (Günther)

Chascomopsetta prorigera Gilbert.

Chascomopsetta prorigera Gilbert: U. S. Fish. Comm., Bull., vol. 23, pt. 2, p. 689, fig. 271, 1903 (1905) (type loc., off north Maui in 187 to 202 fathoms).

D. 125; A. 89; scales 140; gill rakers 4 or 5, obsolete; arch of lateral line 6 in straight section; lower eye advanced; lower eye 3 4/5 in head from snout tip, mandible protruded; interorbital equals eye or half of orbit. Light brownish olive, coarsely flecked with light brown. Along lateral line 3 irregular dark blotches. Dorsal and anal finely mottled, with series of large brown spots along basal half. Left pectoral dusky. Length 225 mm. (Gilbert)

Nematops microstoma Günther.

Nematops microstoma Günther: Rept. voyage "Challenger," vol. 1, p. 57, pl. 24, fig. C, 1880 (type loc., outside Nares Harbor, Admiralty Islands, in 152 fathoms).

Head 4 1/3; depth 2 1/2; D. 64; A. 54; scales 65; eye 2 1/2 in head, with tentacle at posterior half nearly long as eye diameter; arch of lateral line 3 1/3 in straight section; dorsal begins over middle of upper eye. Dorsal and anal rays dotted with black, and larger black spot on last rays. Caudal black, with broad whitish posterior margin. Length 95 mm. (Günther)

Small dextral species, unique in the supero-posterior orbital tentacle.

Pelecanichthys crumenalis Gilbert and Cramer.

Pelecanichthys crumenalis Gilbert and Cramer: U. S. Nat. Mus., Proc., vol. 19, p. 433, pl. 47, 1897 (type loc., off Hawaiian islands in 295 to 298 fathoms).—Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 690, 1903 (1905) (Pailolo and Kaiwi Channels; off Oahu; Maui; in 238 to 344 fathoms).

Head 4 1/3 to 5 1/4; depth 3 1/2 to 4; D. 121; A. 88; pores 230 to 240; eye 3 3/4 in head; mouth enormous, gape long as head. Light brown. Length 256 mm. (Gilbert and Cramer)

PARALICHTHYINAE

Pseudorhombus arsius (Buchanan-Hamilton).

Pleuronectes arsius Buchanan-Hamilton: Fishes of Ganges, pp. 128, 373, 1822 (type loc., estuary below Calcutta).

Pseudorhombus russelli Bleeker: Atlas ichth., Ind Néerl., vol. 6, p. 6, pl. (2) 232, fig. 2, 1866-72 (New Guinea).—Günther: Rept. voyage "Challenger," vol. 1, p. 46, 1880 (Arafura Sea in 35 to 49 fathoms).

Pseudorhombus polyspilos Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 298, 1868 (Waigiu).

D. 71 to 79; A. 54 to 61; scales 75 to 85. Left side reddish brown, usually covered with variously sized rings and often 2 dark ocelli on straight portion of lateral line. Length 305 mm. (Day)

East Africa to India, East Indies and Australia.

Pseudorhombus guttulatus Macleay.

Pseudorhombus guttulatus Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 276, 1883 (type loc., Hood Bay, New Guinea).

Depth nearly 2; D. 75; A. 63; teeth acute, sloping backwards. Dorsal begins in front of eyes, which large, almost in same plane and separated by narrow ridge. Uniform gray, fins lighter, whole covered with minute brown dots. Length 102 mm. (Macleay)

Pseudorhombus triocellatus (Schneider).

Pleuronectes triocellatus Schneider: Systema ichth., Bloch, p. 145, 1801 (type loc., Tranquebar).

Pseudorhombus triocellatus Kner: Reise "Novara" Fisch., vol. 1, pt. 5, p. 284, 1865 (Tahiti).

D. 66 to 69; A. 47 to 51; scales 65 to 70. Three large black ocelli, with white edges, in middle of body length. Length 102 mm. (Günther)

Known only from Oceania by Kner's record for Tahiti. The species is a native of India and the East Indies.

PLEURONECTINAE

Poecilopsetta hawaiiensis Gilbert.

Poecilopsetta hawaiiensis Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 679, pl. 95, 1903 (1905) (type loc., Pailolo Channel between Molokai and Maui in 128 to 138 fathoms; Laysan; Oahu in 128 to 238 fathoms).

Head 4 1/6; depth 1 7/8; D. 62 to 67; A. 53 to 58; scales 85 to 90; arch of lateral line 2 3/4 in straight section; gill rakers 8 + 12, very short. Eyes opposite. Dorsal begins above middle of upper eye. Light olive brown on right side, with very fine brown spots and some faint dark spots and bars. Series of brown blotches on dorsal and anal basally. Right pectoral narrowly black edged. Caudal with pair of large black spots on middle of outer rays. Length 126 mm. (Gilbert)

In the National Museum 9 Hawaiian specimens.

SAMARINAE

Samaris corallinus (Gilbert).

Samariscus corallinus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 682, pl. 96, 1903 (1905) (type loc., south of Molokai in 43 to 73 fathoms).

Head 5 1/5; depth 2 4/5; D. 75 to 77; A. 63 to 65; scales 98 to 100; lateral line without arch; gill rakers 2 or 3 rudiments. Eyes opposite. Dorsal begins at front of upper eye. Right side coralline red mottled and spotted with blackish, pearly gray and pinkish white. Two round black spots with small orange center near outlines of body at origin of last third of total length. Fins mottled and spotted like body, but in finer pattern. Length 110 mm. (Gilbert)

Two Hawaiian specimens in the National Museum.

Brachypleura novae-zealandiae Günther.

Brachypleura novae-zealandiae Günther: Cat. fishes Brit. Mus., vol. 4, p. 419, 1862 (type loc., New Zealand).—Günther: Rept. voyage "Challenger," vol. 1, p. 49, 1880 (Arafura Sea in 35 to 49 fathoms; off New Guinea in 30 fathoms).

Head 3 1/4; depth 2 1/2; D. 72; A. 48; scales 30; snout long as eye, 4 1/2 in head; maxillary to middle of orbit; eyes separated by mere ridge, upper advanced. Uniform transparent. Length 91 mm. (Günther)

New Zealand, East Indies.

SOLEIDAE

Achirus pellucidus Bennett (Whaling voyage, p. 277, 1840) is incompletely described from 2 young specimens, one obtained in the Pacific at S. Lat. 27° and W. Long. 170°, and the other about a day's sail from the Marquesas Islands. It is noted as follows:

Body thin, circular, smooth, sinistral. No pectoral. Colorless, except slender pink streak on margin of back and few similar lines on sides, and as transparent as a *Leptocephalus*. Iris silvery. Length 51 mm.

ACHIRINAE

Achirus hartzfeldi Bleeker.

Achirus hartzfeldi Bleeker: Nat. Tijds. Ned. Ind., vol. 4, p. 123, 1853 (type loc., Amboina).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 5, 1859 (Doreh, New Guinea).

Head 5 (with caudal); depth 3; D. 94 to 101; A. 63 to 65; scales 100; upper part of eye hook like; interorbital less than eye. Brownish, with 5 or 6 black ocelli, dotted with white, on, and nearly as many above and below, the lateral line. Head, body and fins with scattered small black spots besides. (Günther)

East Indies. Reaches 115 mm.

Achirus thepassii Bleeker.

Achirus thepassii Bleeker: Nat. Tijds. Ned. Ind., vol. 6, p. 500, 1854 (type loc., Amboina).

Achirus thcpassi Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 298, 1868 (Waigiu).

Depth 2 2/3 to 2 3/4 (with caudal); D. 67; A. 46; scales 80; eyes subcontiguous. Dorsal and anal fins simple, or bifid at top only. Violet olive, with numerous

small brown dots, with 2 large irregular brown blotches on lateral line and 4 similar spots along back. (Günther)

East Indies. Reaches 67 mm.

SOLEINAE

Aseraggodes melanostictus (Peters).

Solea (Achirus) melanosticta Peters: Akad. Wiss. Berlin, Monatsb., p. 845, 1876 (1877) (type loc., Bougainville Island in 40 fathoms).

Head 4; depth 2 3/4; D. 73; A. 54; scales 70. Eyes close, upper little advanced. Tip of upper lip slightly curved. Front nostril tubular. Scales pectinate. Lateral line divides both sides, little inclined. Vertical fins and ventral confluent; dorsal begins above snout end; no pectoral; both ventrals well developed, rays 5, right little large. Gray brown, on right side with scattered small blotches forming indistinctly cross rows. Vertical fins dark, edges paler. Length 90 mm. (Peters)

Known only from the type.

Aseraggodes klunzingeri (Weber).

Pardachirus klunzingeri Weber: Nova Guinea, vol. 5, pt. 2, p. 250, pl. 13, fig. 2, 1908 (type loc., Merauke River mouth, south New Guinea).

Aseraggodes klunzingeri Weber: Nova Guinea, vol. 9, pt. 4, p. 588, 1913 (Varen River; Lorentz River; Bivak River; Alkmaar).

Head 4; depth 3; D. 69 to 75; A. 53 to 55; scales 80 to 84, tubes 64. Right side coffee brown with irregular blotches; better marked blackish blotches 4 to 6 along dorsal and anal bases, separated by lateral line. Sometimes these blotches numerous and extend on fins. Blind side yellowish-white. Length 123 mm. (Weber)

Asseraggodes persimilis (Günther).

Solea persimilis Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 346, 1909 (type loc., New Pommerania).

Head 4 1/4; depth 2 1/4; D. 64; A. 52; scales 100. Interorbital equals eye and upper eye little advanced. Front edge of head and right lower lip fringed. Scales ctenoid. No pores at bases of fin rays. With exception of front and hind short dorsal rays no distinctive separation, fin nearly extending half way in head. Caudal rounded, 2/3 of head. No pectorals. Left ventral separated from vent. Brown. Whitish or rosy ocelli, larger on body, smaller on fins and head. Each scale at inner half of ocellus with brownish spot, but without other brown or black spot at inner half of same; each ocellus with narrow black edge. Length 133 mm. (Günther)

Pardachirus pavoninus (Lacépède).

Achirus pavoninus Lacépède: Hist. nat. Poiss., vol. 4, pp. 658, 661, 1802 (type loc., "The Dutch collection ceded to France").

Pardachirus pavoninus Schmeltz: Mus. Godeffroy, Cat. 4, p. 24, 1869 (Pelew Islands).—Günther: Cruise of "Curacoa" (Brenchley), p. 410, 1873 (Solomon Islands).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 86, 1906 (Fatè).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 347, 1909 (New Pommerania; Solomons; Tonga).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 332, 1911 (Tonga).

Achirus barbatus (non Lacépède?) Thiollière: Fauna Woodlark, p. 210, 1857 (Woodlark Island).

Achirus napai (Montrouzier) Thiollière: Fauna Woodlark, p. 210, 1857 (name in synonymy).

Head 4 4/5; depth 2 1/5; D. 63; A. 53; scales 83 counted from opposite gill opening close along lateral line to caudal base and 7 more on latter; tubes (cephalic 31 +) 77 in lateral line to caudal base and 8 more on latter; 32 scales above lateral line, 30 below at widest part of body; snout measured to lower eye 2 2/5 in head; lower eye 9; maxillary 2 4/5; interorbital 6 1/2.

Body elongately ovoid. Least depth of caudal peduncle 2 in head. Head width 2 1/2 in its length. Upper eye slightly advanced, little larger, also slightly less than half of snout. Mouth small, oblique, short curved gape, jaws even. Teeth minute, in narrow inconspicuous band on left side of jaws only. Maxillary slender, reaches opposite upper eye. Interorbital deeply concave, with raised bony rims especially forward and at interorbital boundaries. No gill rakers. Gill opening extends forward opposite middle of lower eye. Scales on both sides small, mostly uniform, with 22 to 32 basal parallel striae; apical denticles 8 to 10, with 3 or 4 more gradually lower basal series. Lateral line begins above snout tip, extends midway along side of body, with slender, simple tubes; second lateral line of blind side only developed anteriorly along edge of dorsal profile. Dorsal begins on snout tip, extends to caudal base; height of dorsal 1 5/6 in head. Anal like dorsal, both covered largely over basal portions with scales; anal height 1 4/5 in head. Caudal free, rounded convexly behind, finely scaly; length 1 2/5 in head.

Color in alcohol dull brown on right side, head and body with rather close set numerous deep brown rings, which also extend on fins basally at least. Left side much paler, uniform. Length 123 mm.

One in the Bishop Museum from Fatè. One young in the National Museum from Tonga.

The account of *Achirus barbatus* by Thiollière mentions that his drawings may differ from the east African form as figured by Geoffroy St. Hilaire and Rüppell. It is quite likely that this nominal form is *P. pavonius*. Thiollière says it differs in spots on brown side circular with brown dot in center and rest scattered all over body.

East Indies and Melanesia.

Soleichthys heterorhinos (Bleeker).

Solea heterorhinos Bleeker: Soc. Ind. Neerl., Act. (Amboina), vol. 1, p. 64, 1856 (type loc., Amboina).

Soleichthys heterorhina Schmeltz: Mus. Godeffroy, Cat. 4, p. 24, 1869 (Samoa).—Günther: Rept. voyage "Challenger," vol. 1, p. 36, 1880 (Ovalau, Fiji).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 345, 1909 (Ponapé; New Britain; Samoa; Tonga; Fiji).

Solea nigrostriolata Steindachner: Akad. Wiss. Wien., Sitz., vol. 61, p. 427, pl. 1, fig. 2, 1870 (type loc., Viti Levu).

Parophrys nigrostriolata (Kner) Steindachner: Akad. Wiss. Wien, Sitz., vol. 61, p. 427, 1870 (name in text).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 24, 1869 (Viti Levu).

Head 6 to 6 2/5; depth 2 4/5; D. 88 to 94; A. 80 to 82; scales 110; eyes continguous, 3 or less in head; right pectoral longer than left, 2 in head. Olive, with irregular blackish cross bands, about 7 on head, 16 on body; most of latter geminate, curved, extend on dorsal and anal. Vertical fins yellow edged. Length 126 mm. (Günther)

East Indies, Samoa, Fiji.

BRACHIRINAE

Brachirus zebra (Bloch).

Pleuronectes zebra Bloch: Nat. ausländischen Fische, pt. 3, p. 27, pl. 187, 1787 (type loc., East Indies).

Synaptura zebra Günther: Rept voyage "Challenger," vol. 1, p. 49, 1880 (Arafura Sea in 35 to 49 fathoms).

Head 7; depth 3 or more; D. 77 to 89; A. 66 to 79; lateral line 126 to 128. Upper eye slightly advanced. Jaws equal. Nasal tube very short. Left membrane dilated into flap, which annexed to pectoral, which very short but rather broad. Upper part of right pectoral

prolonged, equal in length to its distance from front eye edge. Reddish olive, with 12 pairs of brown bands: first across snout, second behind eyes, third across gill opening; bands of posterior pairs sometimes confluent into simple bands. Caudal brownish black, with some irregular roundish white spots. (Günther)

India, East Indies, China. Reaches 185 mm.

Brachirus arafurensis (Günther).

Synaptura arafurensis Günther: Rept. voyage "Challenger," vol. 1, p. 49, 1880 (type loc., Arafura Sea in S. Lat. 8° 56′, E. Long. 136° 5′ in 35 fathoms).

Head 5 (in total); depth 2 1/2; D. 65; A. 52; lateral line 100. Eyes very small, on single protuberance which may partially be received in hollow. Upper jaw slightly overlaps lower. Nasal tubes short. All scales ciliated, not larger on neck. Several patches of black filaments on different parts of body; largest in middle of length of lateral line, 2 or 3 smaller ones along dorsal, anal, and 1 on caudal bases. Last dorsal and anal ray extends beyond middle of caudal. Pectoral rudimentary, 6 in head; right black between rays and axil black also. Uniform brownish gray. Length 108 mm. (Günther)

Only the type known.

Brachirus heterolepis (Bleeker).

Synaptura heterolepis Bleeker: Soc. Sci. Ind. Neerl., Act. (Amboina), vol. 1, p. 65, 1856 (type loc., Amboina).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 347, 1909 (New Pommerania).

Head 5 to 5 1/2; depth 2 1/2 to 2 3/4; D. 64 to 70; A. 50 to 55; scales 90 to 100. Interorbital rather more than eye. Upper jaw overlaps lower. Neck scales not larger than body scales; scales on blind side not ciliated, emarginate; some scales with cutaneous filaments. Right pectoral 3 in head. Brown, marbled blackish and irregularly spotted with whitish. Pectoral black. (Günther)

East Indies, New Pommerania. Reaches 360 mm. according to Bleeker, from whom some of above details also taken.

Brachirus dicholepis (Peters).

Synaptura dicholepis Peters: Akad. Wiss. Berlin, Monatsb., p. 844, 1876 (1877) (type loc., New Hanover).

Head 6; depth 2 1/6; D. 66; A. 55; lateral line 115 to 120. Upper eye not advanced. Upper lip curved. Interorbital wider than eye. Nuchal scales not larger than body scales; scales of both sides larger toward caudal; right scales ctenoid, left cycloid. Right pectoral 3 in body, longer than left. Dusky green, irregularly spotted with blackish, above and below with obscure blackish cross bands. Length 315 mm. (Peters)

Brachirus villosus (Weber).

Synaptura villosa Weber: Nova Guinea, vol. 5, pt. 2, p. 251, pl. 13, fig. 3, 1908 (type loc., Wogani River in Urama basin, south New Guinea).—Weber: op. cit., vol. 9, pt. 4, p. 590, 1913 (Verlaten Bocht, Alkmaar, Merauke, Sabang, Lorentz River, Regen Island).—Regan: Zool. Soc. London, Trans., vol. 20, pt. 6, p. 276, 1914 (Mimika River, New Guinea).

D. 65 to 69; A. 52 to 55; scales 80. Length 105 mm. (Weber).

CYNOGLOSSINAE

Cynoglossus kopsii (Bleeker).

Plagusia kopsii Bleeker: Nat. Tijds. Ned. Ind., vol. 2, p. 494, 1851 (type loc., Rio, East Indies).

Cynoglossus kopsi Günther: Rept. voyage "Challenger," vol. 1, p. 49, 1880 (Arafura Sea in S. Lat. 8° 56′, E. Long. 136° 5′).

Head 5 (in total); depth little less than 4; D. 101 or 102; A. 76 to 79; lateral line 55, of which 3 on left side and 1 on right. Eyes subcontiguous. Mouth angle nearer snout end than gill opening; rostral hook nearly reaches opposite front eye edge. Lips not fringed. Two nostrils, 1 between eyes, other above mouth cleft. Grayish. Body and fins with numerous oblong spots. Length 140 mm. (Bleeker)

East Indies.

Cynoglossus heterolepis Weber.

Cynoglossus heterolepis Weber: Leyden Mus., Notes, vol. 32, no. 4, p. 237, 1910 (type loc., Lorentz River, New Guinea).—Weber: Nova Guinea, vol. 9, pt. 4, p. 590, 1913 (Lorentz River; Bivak Island; Alkmaar; Rivierkamp, Sabang).

Head 4 1/2 to 5; depth 5; D. 110 to 115; A. 84; lateral line 114, of which 3 on left side. Dark brown, with dark cross bands, irregular or alternately irregular. Length 253 mm. (Weber)

Symphurus undatus Gilbert.

Symphurus undatus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 690, pl. 98, 1903 (1905) (type loc., northwest of Oahu in 159 to 216 fathoms).

Head 5; depth 4 1/5; D. 108 to 115; A. 95 to 102; scales 114 to 125, without lateral line. Eyes very small, close, opposite. Maxillary reaches front or middle of pupil. Dorsal begins over middle of upper eye. Light olivaceous, faintly marbled with light olive brown; indistinct dark lines follow rows of scales. Fins slightly dusky, unmarked. Length 106 mm. (Gilbert)

Symphurus strictus Gilbert.

Symphurus strictus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 691, fig. 272, 1903 (1905) (type loc., south of Oahu in 265 to 280 fathoms; off Kauai in 286 to 399 fathoms).

Head 4 7/8; depth 3 2/5; D. 97 to 103; A. 87 or 88; scales 106 to 113, without lateral line. Eyes very close, upper slightly advanced. Maxillary reaches middle of lower eye. Dorsal begins over middle of upper eye. Warm brown, with narrow, wavy streaks of light olive, streaks running in all directions and irregularly anastomosing. Fins translucent, frequently rays more or less brown. Length 105 mm. (Gilbert)

Symphurus vittatus Weber.

Symphurus vittatus Weber: Nova Guinea, vol. 5, pt. 2, p. 250, pl. 13, fig. 6, 1908 (type loc., Merauke River mouth, south New Guinea).

Head 4 1/3 (in total); depth 4 1/3; D. 118; A. 90; lateral line 100. Upper eye advanced. Interorbital less than eye. Flesh color both sides. Each scale of left side with small dark streak. Dorsal and anal dark medially. Length 90 mm. (Weber)

ZEIDAE

Zenopsis nebulosus (Schlegel) (Pl. V, *A*).

Zeus nebulosus Schlegel: Fauna Japonica, Poiss., p. 123, pl. 66, 1847 (type loc., Nagasaki).

Zenopsis nebulosus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 376, 1923 (Honolulu).

Head 2 3/4 to 2 4/5; depth 2 1/4 to 2 1/2; D. IX, 27; A. III, 26 or 27; 5 or 6 bony plates along spinous dorsal base, 7 along soft dorsal base, 7 to 9 along anal base, each of larger with single spine; 8 serrae along each side of preanal edge; snout 2 1/8 to 2 1/5 in head from upper jaw tip; eye 4 2/3 to 4 7/8; maxillary 2; interorbital 5 1/8. Least depth of caudal peduncle 1 3/4 in eye. Eye 2 1/4 in snout. Gill rakers 3 or 4 + 9 or 10 short denticles. Caudal 2 in head; pectoral 2 3/5; ventral 1 3/5. Obscure dusky blotch on middle of side below spinous dorsal. Generally dull brown. Membranes of spinous dorsal and ventral terminally black.

Two specimens in the Bishop Museum, 633 and 759 mm., the former obtained October 15, 1914. Both procured in the markets of Hono-

lulu, where occasionally seen. Not previously reported from the Hawaiian islands.

Stethopristes eos Gilbert.

Stethopristes eos Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 622, fig. 241, 1903 (1905) (type loc., Pailolo Channel, between Molokai and Maui, 284 to 290 fathoms).

Ventral spines greatly reduced. Continuous series of carinated spinous bucklers from throat to anus. About 27 rows of scales on cheek. Length 130 mm. (Gilbert)

Cytomimus stelgis Gilbert.

Cytomimus stelgis Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 624, pl. 80, fig. 2, 1903 (1905) (type loc., near Barbers Point, south shore of Oahu, 192 to 352 fathoms).

Ventral spine strong, moderate. Thoracic region wide and flat, without ridge or spinous scutes. Cheek with 4 rows of scales. Length 91 mm. (Gilbert)

GRAMMICOLEPIDAE

Grammicolepis brachiusculus Poey.

Grammicolepis brachiusculus Poey: Real. Soc. Espanola Hist. Nat., Ann., vol. 2, p. 403, pl. 12, 1873 (type loc., Havana).

Vesposus egregius Jordan: U. S. Nat. Mus., Proc., vol. 59, p. 650, 1921 (type loc., Hawaii).

I have examined the type *Vesposus egregius* in the National Museum, a dry specimen 308 mm. long, from the coast of Hawaii at the Mauna Loa lava flow.

STEPHANOBERYCIDAE

Malacosarcus macrostoma (Günther).

Scopelus macrostoma Günther: Ann. Mag. Nat. Hist. London, 5th ser., vol. 2, p. 186, 1878 (type loc., mid-Pacific, in 2425 fathoms).

Malacosarcus macrostoma Günther: Rept. voyage "Challenger," vol. 22, p. 30, 1887 (types; near Low Archipelago in 2350 fathoms).

Head 3; depth 4; D. 13; A. 13; scales extremely thin, not sculptured, deciduous, irregular, moderate. Gill rakers 27. Transparent, sides of head and abdomen black. Length 89 mm. (Günther)

MELAMPHAIDAE

Melamphaes unicornis Gilbert.

Melamphaes unicornis Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 615, pl. 77, fig. 1, 1903 (1905) (type loc., near Kauai in 480 to 881 fathoms).

Head 2; depth 3 1/4; D. II, 12; A. I, 8; scales 25 in lateral line. Gill rakers 8 + 15. Head jet black, trunk grayish or brownish. Dark bar at caudal base. Length 31 mm. (Gilbert)

Melamphaes mizolepis (Günther).

Scopelus mizolepis Günther: Ann. Mag. Nat. Hist. London, 5th ser., vol. 2, p. 185, 1878 (type loc., south of New Guinea in 800 fathoms).

Head 2 1/2; depth 3 1/2; D. III, 10; A. I, 8; eye 7 in head, half of snout; scales perhaps not over 18 along lateral line. Black. Length 76 mm. (Günther)

Off Aru Islands.

Caulolepis longidens Gill.

Caulolepis longidens Gill: U. S. Nat. Mus., Proc., vol. 6, p. 258, 1883 (1884) (type loc., N. Lat. 39° 27′ 10″, W. Long. 69° 56′ 20″ in 1346 fathoms).—Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 616, 1903 (1905) (near Bird Island in 1164 to 1594 fathoms).

Head 3; depth 2; D. 18; A. 8; 14 disks along course of lateral line; about 12 scales in an oblique line downward and backward from dorsal origin to lateral line; eye 7 2/5 in head. (Gilbert)

POLYMIXIIDAE

Polymixia japonica Günther (Pl. V, *B*).

Polymixia japonica Günther: Ann. Mag. Nat. Hist. London, 4th ser., vol. 20, p. 436, 1877 (type loc., off Inosima, Japan).

Polymixia berndti Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 616, pl. 78, 1903 (1905) (type loc., Honolulu market; off Northwest coast Oahu, 195 to 241 fathoms).

Head 2 3/4 to 2 9/10; depth 2 2/3 to 2 3/4; D. V, I, 35, I; A. IV, 17, I; pores in lateral line 33 to 35 to caudal base and 2 to 4 more on latter; scales 50 to 53 in lateral line to caudal base and 6 or 7 more on latter; 8 scales above lateral line, 13 below; 45 to 49 predorsal scales; cheek with 7 rows of scales; head width 2 in its length; snout 3 1/8 to 4 1/3; eye 4 to 4 1/4; maxillary 1 7/8 to 2; interorbital 3 4/5 to 4. Barbels reach pectoral origin. Gill rakers III, 4+8, V, lanceolate, about equal gill filaments or half of eye. Scales with 5 basal marginal scallops; apical denticles fine, possibly 9 oblique series of minute irregular points. Uniform olive-brown above, below uniformly pale or light brown. Pectoral base black, also caudal lobes, front portions of soft dorsal and anal and outer portions of paired fins. All fins and barbels with pale edges.

Six in the Bishop Museum from Honolulu. The first taken about 1912 and the others several years later. One obtained by W. A. Bryan, March 3, 1914. Largest 475 mm.

Polymixia berndti Gilbert was based on a half-grown specimen 186 mm. long. The alleged characters of distinction, such as the more slender head, supplemental maxillary nearly half of maxillary expansion and larger scales are simply variants of conditions of age.

BERYCIDAE

Beryx decadactylus Cuvier (Pl. V, *C*).

Beryx decadactylus (Cuvier and Valenciennes) Cuvier: Règne animal, vol. 2, p. 151, 1829 (nomen nudum).—Cuvier: Hist. nat. Poiss., vol. 3, p. 165, 1829 (no type locality).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 376, 1923 (Honolulu).

Head 2 1/10 to 2 5/6; depth 2 to 2 1/3; D. IV, I, 18, I or I, 19, I; A. IV, 27, I or 28, I; P. II, 14; V. I, 9 or 10; scales 52 to 55 in lateral line to caudal base and 7 to 10 more on latter; 9 or 10 scales above lateral line, 17 to 19 below; 25 to 31 predorsal scales; snout 3 7/8 to 4 2/5 in head measured from upper jaw tip; eye 2 1/5 to 2 2/3; maxillary 1 4/5 to 1 7/8; interorbital 4 to 4 1/3.

Body strongly compressed, ellipsoid, rather deep. Caudal peduncle compressed, least depth 3 to 3 2/5 in total head length. Head width 1 7/8 to 2 in head length. Snout obtuse, length 3/5 to 3/4 its width. Large oblique maxillary reaches eye center, little beyond hind pupil edge in adult or 3/5 of eye; expansion 1 1/2 to 1 3/4 in eye. Mandible well protruded. Interorbital broadly convex. Preorbital spine strong. Gill rakers 7+19, lanceolate, twice gill filaments or 2 1/8 in eye. Scales with 12 to 18 strong apical denticles. Scales in 4 or 5 rows on cheek. First branched dorsal ray 1 3/5 to 1 2/3 in total length of head. Anal begins about opposite middle or first third of dorsal base; second branched anal ray 1 9/10 to 2 1/4 in head. Caudal strongly forked, lower lobe 1 1/10 to 1 1/5 in head. Pectoral reaches base of first to fifth anal ray; 1 1/5 to 1 1/3 in head. Ventral not or quite to origin or base of first soft anal ray;

origin close behind or opposite middle of pectoral base; fin 1 2/3 to 1 3/4 in head. Bright rose-red.

In the Bishop Museum 4 specimens, largest 583 mm., all from Honolulu. Two of these were obtained in 1910 and the other October 1918 and February 21, 1922. Not previously reported from Hawaii, though its occurrence in Japan was noted by Steindachner and Döderlein.

ANOMALOPIDAE

Anomalops katoptron (Bleeker).

Heterophthalmus katoptron Bleeker: Soc. Sci. Ind. Neerl., Act. (Manado), vol. 1, p. 43, 1856 (type loc., Manado, Celebes).

Anomalops graeffei Kner: Akad. Wiss. Wien, Sitz., vol. 58, pt. 1, pp. 26, 294, pl. 1, fig. 1, 1868 (type loc., Kandavu).

Anomalops palpebratus (non Pallas) Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 143, pl. 91, fig. A, 1876 (Paumotus).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 20, 1906 (Faté, New Hebrides; Rarotonga).

Head 2 7/8; depth 2 7/8; D. V-1, 14, 1; A. 1, 11, 1; P. 11, 14; V. I, 5; tubular scales 55 in lateral line to caudal base; 74 scales counted close along and above lateral line to caudal base and 7 more on latter; 10 scales above lateral line, 22 below; 16 predorsal scales; snout 4 3/4 in head; eye 2 3/4; maxillary 2; interorbital 2 2/3.

Body compressed, contour elongately ellipsoid. Caudal peduncle compressed, least depth 1 3/4 in its length or 3 1/3 in head. Head deep, compressed, flattened sides approximated below, width 1 2/3 its length. Snout very short, abruptly declivous, length 2/5 its width, surface convex. Eye large, hind edge midway in head length. 3 in snout. Mouth subinferior, oblique, jaws even when closed. Maxillary reaches 3/4 in eye; expansion 2 1/3 in eye. Hind edge of orbital rim with row of pointed fleshy papillae, gradually larger below. Luminous infraorbital organ long as eye, fits in deep crescentic cavity and capable of extension laterally. Jaws with very finely roughened edges, without distinct teeth. Small patch of very fine teeth each side of vomer, none on vomer. Tongue depressed, smooth, pointed free in front. Nostrils simple, close together, posterior little larger, on side of snout close before eye. Interorbital broad, with slight median depression. Bones forming surface of head and shoulder girdle with fine rugose striae.

Gill opening extends forward opposite front eye edge. Gill rakers 10+23, lanceolate, 1 4/5 in eye. Gill filaments 3/5 of gill rakers. Pseudobranchiae long as gill filaments. Isthmus constricted, slender narrow keel forward.

Scales firmly adherent, close set, mostly regular, narrowly imbricated, extend on caudal base and narrow band along soft dorsal and anal. Scales with 20 to 25 well developed apical denticles, 1 to 4 in transverse series; circuli fine basally. Lateral line complete, of small simple tubes, concurrent with dorsal profile of back.

Spinous dorsal origin close behind ventral base, third spine longest and first longer than fourth; third spine 2 2/3 in head. Soft dorsal inserted little nearer snout tip than caudal base, first branched ray longest, 1 5/6 in head. Anal inserted midway between caudal base and pectoral origin, like soft dorsal; second spine 5 1/8 in head; first branched ray 2 1/5. Caudal well forked, pointed lobes equal, 1 1/3 in head. Pectoral moderate, pointed, upper rays longest, 1 4/5 in head. Ventral inserted slightly behind pectoral origin, reaches 3/5 of anal, 1 7/8 in head. Vent close before head.

Color in alcohol dusky-brown, largely uniform. Iris slaty. Infraorbital flap whitish, investing membrane blackish. Spinous dorsal dusky-black. Soft dorsal pale, with broad subterminal blackish-brown longitudinal band and another less wide, basally. Anal blackish-brown with narrow whitish edge. Pectoral and ventral dusky-black, hind edges narrowly whitish. Caudal dusky, upper and lower edges narrowly pale.

One in the Bishop Museum from Rarotonga, 116 mm. long.

Günther's figure shows but 4 dorsal spines and the hind orbital rim apparently entire on the inner edge.

HOLOCENTRIDAE

Rhynchichthys brachyrhynchos Bleeker.

Rhynchichthys brachyrhynchos Bleeker: Nat. Tijds. Ned. Ind., vol. 4, p. 107, 1853 (type loc., Amboina).

Rhynchichthys brachyrhynchus Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 372, 1897 (Rotuma).

This nominal form is the young of some species of *Holocentrus*.

Ostichthys japonicus (Cuvier) (Pl. VI, *A*).

Myripristis japonicus Cuvier: Règne animal, 2nd ed., vol. 2, p. 15, 1829 (nomen nudum).—Cuvier: Hist. nat. Poiss., vol. 3, p. 129, pl. 58, 1829 (type loc., Japan).

Ostichthys japonicus Fowler: B. P. Bishop Mus., Bull. 22, p. 24, 1925 (Honolulu).

Myripristis pillwaxii Steindachner: Akad. Wiss. Wien, Sitz., vol. 102, pt. 1, p. 215, pl. 1, 1893 (type loc., Honolulu).

Ostichthys pillwaxii Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, p. 147, 1903 (1905) Honolulu).—Jordan and Snyder: (U. S.) Bur. Fish., Bull., vol. 26, p. 208, 1906 (1907) (Honolulu).

Twelve specimens in the Bishop Museum from Honolulu, largest 305 mm. long. One Hawaiian specimen in the National Museum.

Myripristis pillwaxii Steindachner is allowed distinct from *Myripristis japonicus* Cuvier by Jordan and Evermann, as they have not compared or considered the *M. japonicus,* but notice the irrelevant *Holotrachys lima!* Now the description and figure of *Ostichthys japonicus* by Jordan and Fowler leave no possible distinction for the Hawaiian fish. The gill rakers in that description given as "6+11" included the tubercular rudiments, whereas Jordan and Evermann's count of "about 7 + 5" do not include the rudiments. An examination of the above noted materials discloses the different methods of counting, showing likewise greater variations. The species is easily distinguished by its coarsely rough scales.

Mauritius, Japan, Hawaii.

Holocentrus ruber (Forskål).

Sciaena rubra Forskål: Descriptiones animalium, pp. 11, 48, 1775 (type loc., Arabia).

Holocentrum rubrum Günther: Cat. fishes Brit. Mus., vol. 1, p. 35, 1859 (Louisiades).—Kner. Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, p. 296, 1868 (Kanathia, Viti Islands, Fiji).—Schmeltz: Godeffroy, Mus., Cat. 5, p. 21, 1874 (Viti; Tonga).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 96, 1874 (Samoa).—Peters: Akad. Berlin, Monatsb., p. 835, 1876 (1877) (New Guinea).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New

Guinea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 352, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 265, 1883 (Hood Bay, New Guinea).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 22, 1885 (Rubi, New Guinea).—Steindachner: Akad. Wiss. Wien, Denk. ,vol. 70, p. 492, 1901 (Samoa).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1374, 1906 (Savaii).—Beaufort: Bijd. Dierk. Amsterdam, 19, p. 110, 1913 (Saonek, Waigiu).

Perca praslin Lacépède: Hist. nat. Poiss., vol. 4, pp. 397, 415, 1802 (type loc., New Britain).

Holocentrus praslin Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 20, 1906 (Faté, New Hebrides).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 225, fig. 26, 1905 (1906) (Apia; Pago Pago).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 117, 1922 (Pago Pago).

Holocentrum orientale Cuvier: Hist. nat. Poiss., vol. 3, p. 147, 1829 (type loc., Red Sea; East Indies; Pondicherry; New Britain; Port Praslin).

Holocentrum atrocissimus (Commerson) Cuvier: Hist. nat. Poiss., vol. 3, p. 149, 1829 (name in text).

Holocentrum albo-rubrum Bleeker: Soc. Ind. Neerl., Act., no. 2, vol. 6, pp. 2, 3, 4, 1859 (Doreh, New Guinea).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).

One in the Bishop Museum from Faté, 68 mm. long. In poor condition. One in the National Museum from New Guinea, 175 mm. long. Two adults, from Samoa. One from Ebon Island, 152 mm. long, and one half grown from Kusaie, both obtained by the Rev. B. G. Snow, in the Agassiz Museum.

Jordan and Seale have stated this species is "not certainly known from the South Seas" contrary to the records of many previous writers. Their attempt to distinguish the nominal *Holocentrus praslin* was unsound and the details of coloration were not justifiable vindication at the time their statement was made.

Widely distributed through the Indo-Pacific, from the Red Sea, Natal, China, and Japan to Samoa.

Holocentrus caudimaculatus Rüppell.

Holocentrus caudimaculatus Rüppell: Neue Wirbelth., Fisch., p. (97) 103, 1835 (type loc., Red Sea) (on Rüppell 1828).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 223, 1905 (1906) (Apia).—Fowler: B. P. Bishop Mus., Bull. 22, p. 32, 1925 (Samoa).

Holocentrum caudimaculatum Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 95, 1874 (Pelew Islands; Apamana, Gilbert Islands).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 11, 1877 (Ponapé).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 351, 1882 (New Guinea).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1374, 1906 (Savaii).

Holocentrus spinifer (non Forskål) Rüppell: Atlas Reis. Nord. Afrika, Fisch., p. 86, pl. 23, fig. 1, 1828 (part).

Holocentrum leonoides Bleeker: Soc. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).

Holocentrus rubellio Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 22, fig. 5, 1906 (type loc., Tahiti).

Holocentrus bowiei Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 353, fig. 1, 1906 (type loc., Tahiti).

In the Bishop Museum the type of *Holocentrus rubellio*, 204 mm. long. It agrees very closely with Bleeker's figure of *Holocentrus caudimaculatus* (Atlas ichth., vol. 9, pl. [2] 356, fig. 3, 1877), except that at present the Tahiti specimen has no white spot behind the last dorsal rays on the upper surface of the caudal peduncle. There is, however, little question of its identity. Six in the National Museum from Samoa. The type of *Holocentrus bowiei* also included. In the Agassiz Museum 2 small specimens from Apia; 2 adults from Ponapé in the Carolines, received from Rev. L. H. Gulick and one 178 mm. long from Apiang, Gilbert Islands, obtained by Andrew Garrett. All these specimens show the white blotch on the caudal peduncle above. Two in the Academy from Apia.

Red Sea, Seychelles, East Indies, Samoa, Tahiti.

Holocentrus binotatus Quoy and Gaimard.

Holocentrum binotatum Quoy and Gaimard: Voyage "Astrolabe," Zool., vol. 3, p. 679, pl. 14, fig. 4, 1834 (type loc., New Guinea; Guam).

Holocentrus binolatum Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 68, 1900 (1901) (Guam).

Holocentrus binotatus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 224, 1905 (1906) (Apia; Pago Pago).

Holocentrum tagen Thiollière: Fauna Woodlark, p. 149, 1857 (type loc., Woodlark Island).

Head 2 2/3 to 2 3/4; depth 2 2/3; D. XI, 1, 13, 1 or 14, 1; A. III, 9, 1; scales 42 to 45 in lateral line to caudal base and 5 more on latter; 4 scales above lateral line, 8 below; 8 predorsal scales; snout 4 to 4 1/5 in head, measured from upper jaw tip; eye 2 4/5 to 3; maxillary 2 1/4; interorbital 5. Smaller specimen differs in having black on first membrane of spinous dorsal mostly over its area, whereas in Guam specimen brownish blotch extends over first 3 membranes of spinous dorsal, though less extensive on third, and all basal. In armature the specimens greatly similar.

In the Bishop Museum, 1 from Agaña, Guam, 126 mm. long and 1 from Shortland Island, Solomon Islands, obtained in 1903, length 106 mm. Three in the National Museum from Samoa.

Seale gives a reference (B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 20, 21, 1902) to Honolulu specimens which I have not located.

New Guinea, Guam, Samoa.

Holocentrus unipunctatus Günther.

Holocentrum unipunctatum Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 95, pl. 65, fig. a, 1874 (type loc., Solomon Islands; Tonga Islands).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 69, 1900 (1901) (Guam).

Head 2 3/5; depth 2 3/5; D. XI, 15, 1; A. IV, 10, 1; scales 42 in lateral line to caudal base and 5 more on latter; 5 scales above lateral line, 8 below; 7 predorsal scales; snout 3 3/4 in head measured from upper jaw tip; eye 3 1/4; maxillary 2 2/3. Gill rakers v, 3+8, iv, lanceolate, equal gill filaments or 2 3/4 in eye. Scales with 4 basal approximated radiating striae, forming as many denticles; apical denticles 19, rather irregular. Uniform pale brown. Each row of body scales with

white spot medianly. Black spot at base of first membrane of spinous dorsal distinct.

One in the Bishop Museum from Sesiog, Guam, obtained June 14, 1900. Length 125 mm.

Holocentrus erythraeus Günther.

Holocentrum erythraeum Günther: Cat. fishes Brit. Mus., vol. 1, p. 32, 1859 (type loc., Sea of San Christoval, Solomons).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 21, 1874 (Samoa).—Günther: Mus. Godeffroy, Jour., vol. 4, p 99, pl. 63, fig. B, 1875 (Solomons; New Hebrides; Hervey Islands; Kingsmills; Society Islands; Paumotus; Hawaiian islands).—Waite: Australian Mus., Mem., no. 3, p. 186, 1897 (Funafuti, Ellice Islands).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 372, 1897 (Rotuma).—Steindachner: Akad. Wiss Wien, Sitz., vol. 115, pt. 1, p. 1374, 1906 (Upolu).

Holocentrus erythraeus Smith and Swain: U. S. Nat. Mus., Proc., vol. 5, p. 127, 1882 (Johnston Island).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 441, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 523, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 161, 1903 (1905) (Honolulu; Kailua).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 224, 1905 (1906) (Samoa).—Fowler: B. P. Bishop Mus., Bull. 22, p. 6, 1925 (Guam).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 9, 1925 (Wake Island).

Holocentrus erythroeus Waite: Australian Mus., Rec., vol. 5, p. 3, 1903 (Paanopa, Ocean Island, Gilbert Group).

Head 2 3/4 to 2 4/5; depth 2 3/4 to 2 7/8; D. IX, 14, 1; A. III, 9, 1; scales 48 in lateral line to caudal base and 5 to 7 more on latter; 4 scales above lateral line, 7 or 8 below, 8 or 9 predorsal; snout 4 1/6 to 4 1/5 in head measured from upper jaw tip; eye 3 2/5; maxillary 2 1/5 to 2 1/3; interorbital 5 to 5 2/5.

Body oblong-ovate, well compressed, deepest at middle of depressed pectoral. Caudal peduncle strongly compressed, least depth 1 3/5 in its length or 3 3/4 in total head length. Head width 2 1/8 to 2 1/5 in its length. Snout conic, long as wide. Eye large, hind edge slightly behind middle in head length; diameter greater than snout or interorbital. Mouth moderate, lower jaw protruding. Maxillary reaches opposite eye center, expansion 1 3/4 in eye. Teeth villiform, in bands in jaws, on vomer and palatines. Nostrils together, vertical slit nearly half diameter of pupil and close before middle of front eye edge. Interorbital slightly depressed. Preopercle spine 1 1/3 in eye. Opercular spines 2, short, upper little larger. Gill rakers IV, 4 + 12, II, lanceolate, equal gill filaments or 2 3/4 in eye. Scales with 5 basal radiating striae, with as many points; apical denticles 23 to 28; circuli fine. Cheek with 5 rows of scales. Lateral line slopes evenly in slight curve from shoulder to caudal base medianly; tubes short. Third dorsal spine 2 4/5 to 3 in total head length; third dorsal ray 1 3/4 to 1 4/5; second anal spine 1 2/3 to 1 4/5; second anal ray 1 2/3; caudal strongly forked, upper lobe 1 1/3; pectoral 1 2/5 to 1 3/5; ventral 1 3/5.

Back pale olivaceous, otherwise body pale brownish. Traces of pale longitudinal bands, each median on scale course where comprising its median third. Spinous dorsal with narrow whitish edge and pale spot on middle of each membrane between each spine. Length 178 to 182 mm.

In the Agassiz Museum 7 from the Kingsmills, obtained by Andrew Garrett, largest 223 mm. Also 2 from Ebon Island, Marshalls, from Rev. B. G. Snow. In the National Museum 1 Hawaiian, 2 from Johnston Island and 1 from Apia. In the Bishop Museum 2 from Wake Island in 1923.

Holocentrus tiere Cuvier (fig. 18).

Holocentrum tiere Cuvier: Hist. nat. Poiss., vol. 3, p. 151, 1829 (type loc., Tahiti).—Lesson: Voyage "Coquille," vol. 2, pt. 1, p. 221, pl. 25, 1830 (Matavai Harbor and Venus Point, Tahiti).

Holocentrus tiere Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 24, 1906 (Tahiti).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 224, 1905 (1906) (Samoa).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 31, 37, 1925 (Samoa; Tahiti).

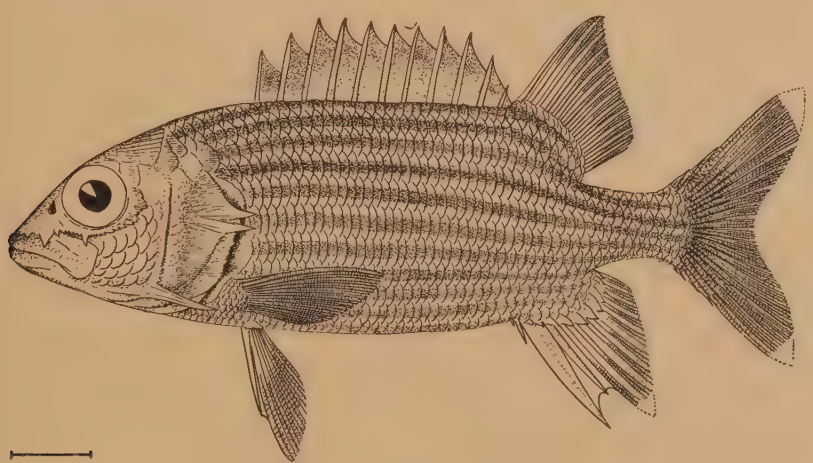

FIGURE 18.—Drawing of *Holocentrus tiere*.

Perca holocentrus (Forster) Lichtenstein: Descriptiones animalium, Forster, p. 191, 1844 (type loc., Tahiti).

Holocentrus poecilopterus (non Bleeker) Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 485, 1899 (type of *Holocenthrus polynesiae*).

Holocentrus binolatum (non Quoy and Gaimard) Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 128, 1902 (1903) (Marcus Island).

Holocenthrus polynesiae Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 229, fig. 3, 1904 (type loc., Thornton Island).

Holocentrus verticalis Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 22, fig. 6, 1906 (type loc., Tahiti).

Holocentrus microstomus (non Günther) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 24, 1906 (Tahiti specimen).

The types of *Holocentrus verticalis* from Tahiti, 4 specimens, in the Bishop Museum. Also 6 other specimens from Tahiti and one 316 mm. long from Marcus Island. Three in the National Museum from Apia. Two young in the Agassiz Museum from Apia. The type of *Holocenthrus polynesiae* from Thornton Island, 279 mm. long, in the Academy.

This species greatly resembles *Holocentrus spinifer,* but differs in the longitudinal dark bands following within the courses of the scales.

Holocentrus tiereoides Bleeker.

Holocentrum tiereoides Bleeker: Nat. Tijds. Ned. Ind., vol. 5, p. 334, 1853 (type loc., Amboyna).—Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 128, 1902 (1903) (Marcus Island).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 20, 1906 (Faté; Tahiti).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 265, 1911 (Papeete, Tahiti; Jaluit, Marshalls).

Differs from *Holocentrus tiere* in the larger scales, which number 40 instead of 50.

The Bishop Museum has 7 from Tahiti, 1 from Marcus Island and 1 from Faté. Largest 203 mm. The National Museum has an adult from Papeete and 1 from Jaluit. In the Agassiz Museum 1 from Papeete.

Holocentrus lacteoguttatus Cuvier (fig. 19).

Holocentrum lacteoguttatum Cuvier: Hist. nat. Poiss., vol. 3, p. 160, 1829 (type loc., Sea of the Indies).

Holocentrus lacteoguttatus Fowler: Copeia, no. 112, p. 82, Nov. 20, 1922 (Hawaiian islands).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 6, 24, 32, 37, 1925 (Guam, Honolulu, Samoa, Tahiti).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 9, 1925 (Laysan, Johnston, and Wake islands).—Fowler and Bean: U. S. Nat. Mus., Proc., vol. 71, p. 14, 1927 (Tahiti).—Fowler: B. P. Bishop Mus., Bull. 38, p. 7, 1927 (Fanning, Baker, and Laysan islands).

Holocentrum punctatissimum Cuvier: Hist. nat. Poiss., vol. 3, p. 160, 1829 (type loc., Strong Island, Caroline Islands).—Lesson: Voyage "Coquille," vol. 2, pt. 1, p. 219, 1830 (Oualan).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 12, 1869 (Samoa; Viti).—Bleeker: Nat. Tijds. Dierk., vol. 4, p. 215, 1874 (New Guinea).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1375, 1906 (Upolu, Savaii).

Holocentrus punctatissimus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 162, 1903 (1905) (Hilo; Kailua; Honolulu; Samoa).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 24, 1906 (Tubuai, Austral Islands; Rarotonga, Cook Islands; Faté, New Hebrides; Makatea, Paumotus).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 224, 1905 (1906) (Apia; Pago Pago).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 607, 1908 (Suva, Fiji).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 265, 1911 (Makemo, Paumotus).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 94, 1912 (Easter Island).—Fowler and Silvester: Carnegie Inst., Marine Papers, p. 116, 1922 (Pago Pago).

Holocentrum argenteum Valenciennes: Hist. nat. Poiss., vol. 7, p. 377, 1831 (type loc., New Guinea).—Quoy and Gaimard: Voyage "Astrolabe," Zool., vol. 3, p. 677, pl. 14, fig. 2, 1834 (Port Dorey).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 492, 1901 (Honolulu; Laysan).

Holocentrum stercus muscarum Valenciennes: Hist. nat. Poiss., vol. 7, p. 378, 1831 (type loc., Guam).

Holocentrum diploxiphus Günther: Zool. Soc. London, Proc., p. 660, pl. 60, 1871 (type loc., Samoa Islands).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 97, 1875 (Samoa; Marshalls; Tahiti; Paumotus; Aneiteum).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 372, 1897 (Rotuma).—Waite: Australian Mus., Mem., no. 3, p. 187, 1897 (Funafuti, Ellice Islands).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 501, 520, 1900 (Honolulu, Tahiti).

Holocentrum diploxyphus Schmeltz: Mus. Godeffroy, Cat. 5, p. 21, 1874 (Savaii).

Holocentrus diploxiphus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 500, 1900 (Hawaiian islands).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 441, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 533, 1902 (1904) (Honolulu; Puako Bay; Laysan).

Holocenthrus gladispinis Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 225, fig. 1, 1904 (type loc., Tahiti).

Holocenthrus gracilispinis Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 228, fig. 2, 1904 (type loc., Honolulu).

The Bishop Museum has 14 from Honolulu; 1 at Laie, Oahu, C. Montague Cooke III; 3 young from Oahu (?), W. A. Bryan; 1 Moiliili,

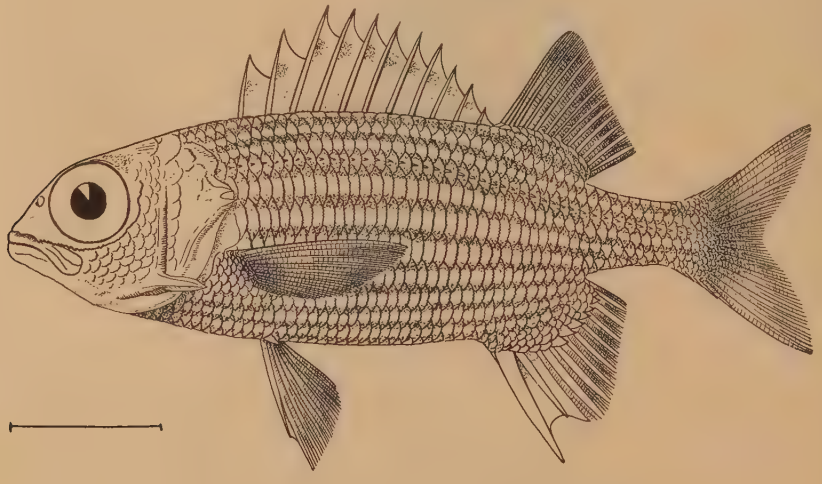

FIGURE 19.—Drawing of *Holocentrus lacteoguttatus.*

Oahu; 1 Laysan in May 1903 from W. A. Bryan; 2 Laysan, 5 Johnston Island and 5 Wake Island in 1923; 2 Rarotonga; 7 Raiatea; 2 Faté; 2 Tubuai; 2 Makatea. Nearly 500 specimens in the Honolulu markets, in November and December 1922. I obtained the species at Waikiki, October 29, 1922. Largest 145 mm. The National Museum has an adult from Honolulu, received from W. Pease; 21 Hawaiian specimens from the Bureau of Fisheries; 4 Samoa; 2 Makemo; 1 Easter Island. The Wilkes Expedition obtained a specimen 135 mm. long at Oahu. The Agassiz Museum contains 2 from Makemo; 3 Apia; 2 Maui, from C. F. Winslow in 1860; 1 Honolulu, W. H. Jones; 14 Kauai, from Andrew Garrett; 18 Hawaiian, also from Andrew Garrett; 2 Society Islands, from Andrew Garrett; 10 Apiang in the Kingsmills, from Andrew Garrett. Types of *Holocenthrus gracilispinis* and *Holocenthrus gladispinis,* and 5 from Apia, in the Academy.

Red Sea, East Indies to Hawaii and Tahiti.

Holocentrus xantherythrus Jordan and Evermann.

Holocentrus xantherythrus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 175, 1902 (1903) (type loc., Honolulu; Kailua).—Snyder: op. cit., vol. 22, p. 523, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 164, pl. 9, 1903 (1905) (Honolulu; Kailua).—Fowler: Copeia, no. 122, p. 82, Nov. 20, 1922 (Hawaiian islands).

Holocenthrus xantherythrus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 225, 1904 (paratype).

Holocentrus zapyrus (Jordan and Evermann) Brigham: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 2, pp. 18, 19, 1903 (1904) (type loc., Kailua) (name only).

In the Bishop Museum 13 from Honolulu and 1 from Kailua. Largest 165 mm. Also 2 types of the nominal *Holocentrus zapyrus,* first published by Brigham as Nos. 1712 and 1713, from Kailua. Faint trace of a dark blotch on the first two membranes of the spinous dorsal. I found 4 specimens in the Honolulu market January 12, 1923. The National Museum contains 5 Hawaiian specimens and the type of *Holocentrus xantherythrus.* Also a specimen from Hilo. In the Agassiz Museum 3 from Honolulu and 3 from Pago Pago. Six Hawaiian specimens in the Academy.

The opercular spine varies greatly. Though two are present in most species, the upper is greatly larger. It may be single on one side of the head and double on the other. Anal spines always shorter than the rays. Jordan and Evermann mention of the spinous dorsal only "dorsal clear deep red, clouded with darker" and all other specimens would appear to have had pale spinous dorsals. Most of mine show a dark blotch forward, many black. The more slender body and usually dark anterior dorsal blotch, seem to distinguish the species from the closely related *Holocentrus furcatus.*

Holocentrus laevis Günther (fig. 20).

Holocentrum laeve Günther: Cat. fishes Brit. Mus., vol. 1, p. 47, 1859 (type loc., Louisiade Archipelago; Gadalcanar, Solomon Islands; Amboina).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 101, pl. 65, fig. B, 1875 (types; Samoa).—Peters: Akad. Wiss. Berlin, Monatsb., p. 835, 1876 (1877) (New Ireland).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1375, 1906 (Upolu).

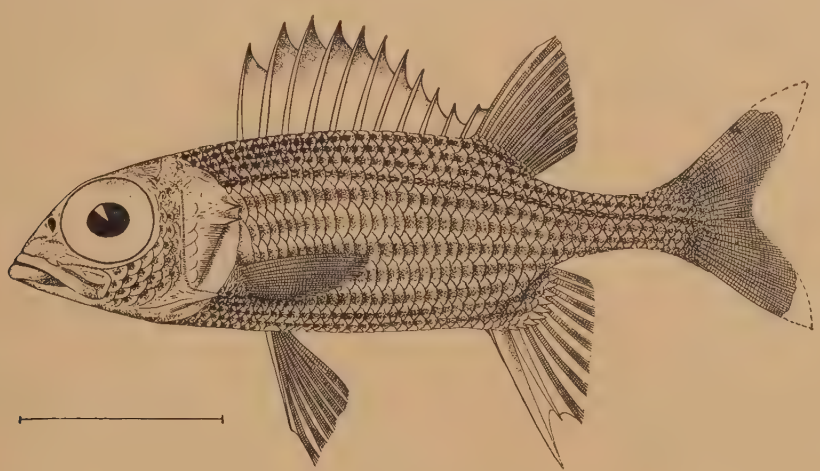

FIGURE 20.—Drawing of *Holocentrus laevis.*

Holocentrus laevis Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 226, (1905) 1906 (Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 22, p. 32, 1925 (Samoa).

Holocentrum goldiei Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 352, 1882 (type loc., New Guinea).

Rhynchichthys novae-britanniae De Vis: Linn. Soc New South Wales, Proc., vol. 8, p. 447, 1884 (type loc., New Britain).

Holocentrus sammara (non Forskål) Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 526, 1900 (Samoa).

Flammeo achromopterus Fowler: Acad. Nat. Sci.

Philadelphia, Proc., p. 236, fig. 6, 1904 (type loc., Samoa).

Holocentrus lacteoguttatus (non Cuvier) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 20, 1906 (Faté, New Hebrides).

Four in the Bishop Museum from Faté and 1 from Tahiti, largest 206 mm. Three in the National Museum from Apia. Twelve in the Agassiz Museum from the Society Islands and 1 from the Kingsmill Islands, all obtained from Andrew Garrett. In the Academy the type of *Flammeo achromopterus* from Samoa.

Seychelles to the East Indies and Samoa.

Holocentrus melanopterus Bleeker.

Holocentrum melanopterum Bleeker: Nat. Tijds. Ned. Ind., vol. 9, p. 302, 1855 (type loc., Manado, Celebes).

Holocentrus operculare (non Valenciennes) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 68, 1900 (1901) (Guam).

Head 3; depth 2 3/5; D. XII, 13, A. VI, 10; scales 40 in lateral line to caudal base and 3 more on latter: 5 scales above lateral line to spinous dorsal origin, 9 below to spinous anal origin; 9 predorsal scales; snout 4 in head; eye 2 3/5; maxillary 2 1/4; interorbital 3.

Body and head well compressed; least depth of caudal peduncle 3 1/8 in head. Head width half its length. Snout obtuse, short, length about 3/5 its width. Eye large, equals interorbital. Maxillary oblique, reaches opposite eye center. Narrow bands of minute teeth in jaws. Mandible included within upper jaw. Interorbital slightly convex. Opercular spines 2, subequal. Preopercle spine well developed, extends over gill opening opposite pectoral origin. Gill rakers III, 4+10, laceolate, long as gill filaments or 2 1/8 in eye. Scales with row of 9 marginal apical denticles; 2 or 3 weak basal lobes without radiating striae; about 20 parallel vertical striae basally. Third dorsal spine 2 1/8 in head; third anal spine longest, not longer than soft rays, 1 7/8 in head; caudal small, emarginate; pectoral 1 3/5 in head; ventral 1 1/2.

Dull olivaceous on back, sides and below paler to whitish. Lower fins pale. Spinous dorsal black on first 2 and last 3 membranes, others white in front and black behind.

One in the Bishop Museum from Agaña, Guam. It agrees in most all respects with Bleeker's figure (Atlas ichth., vol. 9, pl. [3] 357, fig. 2, 1877). Length 48 mm.

Holocentrus furcatus Günther.

Holocentrum furcatum Günther: Cat. fishes Brit. Mus., vol. 1, p. 29, 1859 (type loc., South Sea).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 99, pl. 64, fig. A, 1875 (southwest part of South Sea).

Holocentrus tiere (non Cuvier) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 18, 1902 (Honolulu)

Holocentrus ensifer Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 176, 1902 (1903) (type loc., Honolulu; Kailua).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 165, pls. II and 28, 1903 (1905) (types).—Fowler: Copeia, no. 112, p. 82, Nov. 20, 1922 (Hawaiian islands).

Holocenthrus ensifer Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 235, 1904 (paratype).

Fourteen in the Bishop Museum from Honolulu, largest 241 mm. long. The National Museum has 4 from Honolulu, also the type of *Holocentrus ensifer*. One in the Agassiz Museum from Honolulu. One Honolulu specimen in the Academy.

There is no question of the identity of *Holocentrus ensifer* Jordan and Evermann with *H. furcatus*. The specimens examined, most in different stages of waning coloration, support this view in every way. The whole question for the alleged character of *Holocentrus ensifer* apparently rests with its coloration. It is quite evident Günther's original statement "red, with lighter longitudinal bands" was ignored and simply the imperfect figure of Andrew Garrett, referred to later as "enifarbig roth" used as sufficient grounds for specific distinction.

Holocentrus violaceus Bleeker.

Holocentrum violaceum Bleeker: Nat. Tijds. Ned. Ind., vol. 5, p. 335, 1853 (type loc., Amboina).—Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, p. 296, 1868 (Kandavu, Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 12, 1869 (Samoa; Viti).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 351, 1882 (New Guinea).—Weber: Siboga Exped., vol. 65, p. 182, 1913 (northwest coast of Waigiu).

Holocentrus violaceus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 223, 1905 (1906) (Samoa).—Fowler: B. P. Bishop Mus., Bull. 22, p. 32, 1925 (Samoa).

Holocentrus punctatissimus (non Cuvier) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 24, 1906 (Shortland Island, Solomons).

In the Bishop Museum 1 from Tahiti 193 mm. and 1 from Shortland Island 146 mm. The National Museum has 8 from Samoa. In the Academy 2 from Pago Pago.

Holocentrus laticeps Cuvier.

Holocentrum laticeps Cuvier: Hist. nat. Poiss., vol. 3, p. 157, 1829 (no type locality).—Valenciennes: Hist. nat. Poiss., vol. 7, p. 376, 1831 (Batavia; Vanicolo).

Golden, scales minutely dotted black. Upper half with 7 brown longitudinal bands. Oblique black streak between each pair of dorsal spines, reaching from tip of one spine to base of preceding. Other fins not colored. (Günther)

Holocentrus diadema Lacépède (Pl. VII, *A*).

Holocentrus diadema Lacépède: Hist. nat., Poiss., vol. 4, pp. 335, 372, 1802 (pl. 32, fig. 3 in vol. 3, 1802) ("manuscrits chinois").—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 501, 1900 (Hawaiian islands).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 68, 1900 (1901) (Guam).—Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 128, 1902 (1903) (Marcus Island).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 440, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 523, 1902 (1904) (Honolulu; Laysan Island; off Molokai in 8 fathoms).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 159, pl. 10, 1903 (1905) (Honolulu; Hilo).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 24, 1906 (Tahiti; Faté; Nukuhiva, Marquesas Islands).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 225, 1905 (1906) (Pago Pago).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 265, 1911 (Fakarava, Paumotus).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 95, 1912 (Rikitea, Mangareva).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 116, 1922 (Pago Pago).—Fowler: Copeia, no. 122, p. 82, Nov. 20, 1922 (Hawaiian islands).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 6, 24, 31, 1925 (Guam; Honolulu; Samoa).—

Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 9, 1925 (French Frigates Shoal).

Holocentrum diadema Cuvier: Hist. nat. Poiss., vol. 3, p. 159, 1829 (Borabora, Society Islands).—Lesson: Voyage "Coquille," vol. 2, pt. 1, p. 220, pl. 25, fig. 2, 1830 (Beula Bay, Borabora).—Günther: Cat. fishes Brit. Mus., vol. 1, p. 42, 1859 (Tonga; Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 12, 1869 (Samoa; Viti).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 97, 1875 (Samoa; Tahiti; Tonga; Hawaiian islands).—Streets: U. S. Nat. Mus., Bull., vol. 7, p. 101, 1877 (Samoa).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 352, 1882 (New Guinea).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 492, 1901 (Honolulu; Laysan).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1374, 1906 (Upolu).

Thirteen in the Bishop Museum from Honolulu, 3 from Tahiti, 3 Agaña on Guam, 3 Faté, 1 Marcus Island and 1 Nukuhiva, 3 French Frigates Shoal in 1923; largest 170 mm. I examined 70 in the Honolulu markets during December 1922. In the National Museum 20 Hawaiian, 4 Mangareva, 1 Fakarava, series from Apia, and 2 young Samoan specimens received from Steinberger. The Wilkes Expedition also obtained one at Samoa (?), length 100 mm. In the Agassiz Museum 3 Hawaiian, also 1 adult Hawaiian specimen from Andrew Garrett, 2 from Oahu received from F. G. Eagle, 2 from Honolulu obtained by W. H. Jones, 10 from Apia and 2 from Rikitea. In the Academy 1 Hawaiian and 10 from Apia.

Red Sea, Madagascar, Ceylon, China, Hawaii, Tahiti.

Holocentrus microstomus Günther.

Holocentrum microstoma Günther: Cat. fishes Brit. Mus., vol. 1, p. 34, 1859 (type loc., Amboyna).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 98, pl. 64, fig. B, 1875 (Samoa; Society Islands; Tonga; Hawaiian islands; Hervey Islands; Kingsmills; Paumotus).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 21, 1874 (Savaii; Tonga).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 372, 1897 (Rotuma).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1375, 1906 (Savaii).

Holocentrus microstoma Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 70, 1900 (1901) (Guam).—Seale: op. cit., vol. 1, no. 5, pp. 18, 20, 1902 (Honolulu).

Holocentrus microstomus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 325, 1901 (Thornton Island).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 160, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 160, 1903 (1905) (Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 24, 1906 (Tahiti; Raiatea; Tubuai; Rarotonga).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 226, 1905 (1906) (Samoa).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 24, 31, 1925 (Honolulu, Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 9, 1925 (Johnston and Wake islands).

Holocenthrus thorntonensis Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 231, fig. 4, 1904 (type loc., Thornton Island).

Head 2 4/5 to 2 7/8; depth 3 to 3 1/5; D. XI, I, 12, 1 or 13, 1; A. IV, 9, 1; scales 47 or 48 in lateral line to caudal base and 1 or 2 more on latter; 4 scales above lateral line, 8 or 9 below, 7 or 8 predorsal; snout 3 1/2 to 4 in head measured from upper jaw tip; eye 3 to 3 1/8; maxillary 3; interorbital 4 2/5 to 5.

Body compressed, elongately ovoid, deepest at base of fourth dorsal spine. Caudal peduncle slender, well compressed, least depth 1 4/5 to 2 in its length or 4 to 4 2/5 in total head length. Head width 2 1/4 to 2 2/5 in its length. Snout conic, long as broad. Eye large, slightly impinging on upper profile; diameter slightly greater than snout or interorbital. Mouth small, lower jaw slightly protruding. Maxillary reaches first third or fourth in eye; expansion 2 2/3 to 3 in eye. Lips moderate, papillose. Teeth in villiform bands in jaws, on vomer and palatines. Nostrils together, close before eye and posterior greatly larger. Interorbital depressed, very slightly concave. Preopercle spine 2 1/2 to 3 in eye. Opercle with 2 spines, upper larger. Gill rakers II, 4 + 10, III, lanceolate, equal gill filaments or 3 1/2 in eye. Scales with 5 to 8 basal short knobs; apical denticles 30 or 31; basal striae very fine. Fourth dorsal spine 1 4/5 to 1 5/6 in head; second branched dorsal ray 1 2/3 to 1 4/5; third anal spine 1 1/8 to 1 1/6; first branched anal ray 1 2/5 to 1 1/3; caudal widely forked, 1 2/5 to 1 1/2; pectoral 1 1/2 to 1 3/5; ventral 1 1/4 to 1 1/3.

Back brown, sides and below paler, with silvery-white reflections. Along each row of scales longitudinal whitish band, narrowing behind and following courses of scales. Spinous dorsal pale, with submarginal blackish-brown band, broad over first 2 or 3 membranes, then narrowing. Fins all pale brownish. Length 115 to 143 mm.

In the Agassiz Museum 4 from the Society Islands, obtained by Andrew Garrett. Also 2 young from Pago Pago. Type of *Holocenthrus thorntonensis*, 48 mm. long, in the Academy, is evidently the young of this species. Also 2 from Pago Pago. The Bishop Museum contains 7 from Honolulu, 2 Johnston Island, 1 Wake Island, 5 Tahiti, 2 Tubuai, 2 Guam, 3 Raiatea, 3 Faté, 2 Rarotonga. Largest 203 mm. I found 18 in the Honolulu markets during December, 1922. In the National Museum 4 from Samoa and 1 from Honolulu.

Opercular spines very variable in some specimens, as only one large one may be developed, again two nearly equal, or even three and these may vary on either side of the head. Variation in the anal spine is also noticeable and though usually longer than the longest anal ray it may be barely equal or even shorter. *Holocentrum sur* Thiollière (Fauna Woodlark, p. 148, 1857, type loc., Woodlark Island) is so imperfectly noticed that except for completeness I would omit it. It is said to be very near the Atlantic *Holocentrus ascensionis* (Osbeck), but not the red variety with silvery bands of this species. The third anal spine is very strong. The body is also said to be longer than that of *Holocentrus ascensionis*. Possibly it may refer to *Holocenthrus thorntonensis*.

Holocentrus spinifer (Forskål).

Sciaena spinifera Forskål: Descriptiones animalium, pp. 12, 49, 1775 (type loc., Djedda, Red Sea).

Holocentrum spiniferum Valenciennes: Hist. nat. Poiss., vol. 7, p. 374, 1831 (Ulea).—Günther: Cat. fishes Brit. Mus., vol. 1, p. 39, 1859 (Louisiades).—

Schmeltz: Mus. Godeffroy, Cat. 4, p. 12, 1869 (Samoa; Viti).—Günther: Cruise of "Curacoa," p. 410, 1873 (Solomons).—Bleeker: Ned. Tijds. Dierk., vol. 4, p. 205, 1874 (Waigiu).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 94, 1874 (Vavau; Louisiades; New Hebrides; Solomons).—Streets: U. S. Nat. Mus., Bull., vol. 7, p. 89, 1877 (Fanning Island).—Günther: Rept. voyage "Challenger," vol. 1, p. 58, 1880 (Tongatabu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 351, 1882 (New Guinea).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1374, 1906 (Upolu).

Holocentrus spinifer Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 483, 1899 (Thornton Island).—Fowler: op. cit., p. 526, 1900 (Samoa).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 161, pl. 8, 1903 (1905) (Honolulu; Samoa).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 20, 1906 (Faté; Shortland Island; Raiatea).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 223, 1905 (1906) (Samoa).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 265, 1911 (Makemo, Tuamotus).—Fowler: B. P. Bishop Mus., Bull. 22, p. 32, 1925 (Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 9, 1925 (Johnston and Wake islands).

Holocentrum leo Cuvier: Hist. nat. Poiss., vol. 3, p. 152, 1829 (type loc., Borabora; Waigiu).—Lesson: Voyage "Coquille," Zool., vol. 12, p. 222, 1830 (South Sea; Borabora; Waigiu).—Valenciennes: Hist. nat. Poiss., vol. 7, p. 374, 1831 (Society Islands; Vanicolo; Guam; Carolines).—Quoy and Gaimard: Voyage "Astrolabe," Zool., vol. 3, p. 678, pl. 14, fig. 3, 1834 (Vanicoro).

Holocentrus leo Kittlitz: Reis. Mikronesien, Denk., vol. 2, p. 113, 1858 (Senjawins Island).—Smith and Swain: U. S. Nat. Mus., Proc., vol. 5, p. 125, 1882 (Johnston Island).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 441, 1902 (1903) (Hawaiian islands).

Holocenthrus leo Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 235, 1904 (Thornton Island).

Holocentrus ensifer (non Jordan and Evermann) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 20, 1906 (Mangareva, Gambier Islands).

Holocentrus punctatissimus (non Cuvier) Seale: B. P. Bishop Mus., Oc. Papers, vol. 4, no. 1, p. 24, 1906 (Mangareva).

Holocentrus verticalis (part) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 22, 1906 (Tahiti).

Holocentrus tiereoides (non Bleeker) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 22, 1906 (Shortland Island).

Young specimens have the hind preopercle edge finely and evenly denticulate, but becoming coarsely and unevenly so with age.

The Wilkes Expedition obtained 3 specimens at Samoa and 1 at Oahu, 55 to 252 mm. long, now in the National Museum. Others are 5 Samoa, 1 Fanning Islands, 1 adult Hawaii, 1 Tuamotus, adult Johnston Island. In the Bishop Museum 4 from Honolulu, 6 Johnston Island and 2 Wake Island, 2 Faté, 2 Mangareva, 1 Raiatea, and 2 Shortland Island. In the Honolulu markets I found 3 December 9, 1922 and 1 December 31. The Agassiz Museum has an adult and 4 young from Apiang, Kingsmills and 15 from the Society Islands, all obtained by Andrew Garrett. In the Academy 1 from Thornton Island, 1 from Samoa, and 3 from Pago Pago.

Described as *Holocentrum* No. 71 by Jouan (Soc. Cherbourg, Mem., vol. 8, p. 288, 1861) from a specimen 150 mm. long from Port de France, New Caledonia. D. XI, 13; A. IV, 10. Preopercle spine long, passes opercle. Caudal well forked. Back red and violet, flanks white tinged rose, with longitudinal red and gold reflected lines. Soft vertical fins golden-yellow, rays red. Inner ventral rays purple.

Red Sea, East Africa, Bourbon Island, Tahiti, Hawaii.

Holocentrus scythrops (Jordan and Evermann).

Flammeo scythrops Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 74, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 157, fig. 57, 1903 (1905) (type, Honolulu; Hilo).

Holocentrus scythrops Fowler: B. P. Bishop Mus., Bull. 38, p. 8, 1927 (Honolulu).

Holocentrus rubrum (non Forskål) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 19, 1902 (Honolulu).

Nine specimens in the Bishop Museum from Honolulu. I examined 11 in the Honolulu market during December 1922. Largest 215 mm. Two in the National Museum from Honolulu, one the type of *Flammeo scythrops*. One in the Agassiz Museum from Honolulu.

Holocentrus sammara (Forskål).

Sciaena sammara Forskål: Descriptiones animalium, pp. 13, 48, 1775 (type loc., Djedda, Red Sea).

Holocentrus sammara Kittlitz: Denkw. Reis. Mikronesien, vol. 2, p. 22, fig. 1858 (Ulea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 24, 1906 (Tahiti; Shortland Island; Solomons; Raiatea, Society Islands; Rarotonga, Cook Islands; Nukuhiva, Marquesas Islands).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 227, 1905 (1906) (Apia).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 353, 1906 (Tahiti).—Jordan and Snyder: (U. S.) Bur. Fish., Bull., vol. 26, p. 208, 1906 (1907) (Honolulu).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 265, 1911 (Taritari, Gilbert Islands; Makemo and Fakarava, Paumotus; Suva, Fiji).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 95, 1911 (Mangareva, Gambier Islands).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 117, 1922 (Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 6, 24, 32, 1925 (Guam; Honolulu; Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 9, 1925 (French Frigates Shoal and Wake Island).—Fowler: op. cit., Bull. 38, p. 8, 1927 (Fanning Island).

Holocentrum sammara Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh).—Kner: Reis. Novara, Fisch., vol. 1, pt. 5, p. 9, 1865 (Tahiti).— Schmeltz: Mus. Godeffroy, Cat. 4, p. 12, 1869 (Samoa; Viti).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 100, 1875 (Society Islands; Paumotus).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 352, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 265, 1883 (Hood Bay, New Guinea).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 372, 1897 (Rotuma).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 229, 1898 (Guam).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 492, 1901 (Samoa).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1375, 1906 (Upolu).—Pellegrin: Mus. Hist. Paris, Bull. 18, p. 206, 1912 (Port Sandwich, New Hebrides).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 110, 1913 (Saonek, Waigiu).

Flammeo sammara Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 18, 1902 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 440, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 523, 1902 (1904) (Honolulu; Laysan).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 155, fig. 56, 1903 (1905) (Honolulu; Makemo; Samoa).—Fowler: Copeia, no. 122, p. 82, Nov. 20, 1922 (Hawaii).

Holocentrum tahiticum Kner: Akad. Wiss. Wien, Sitz., vol. 29, p. 482, 1864 (type loc., Tahiti).—Kner: Reis. "Novara," Fisch., vol. 1, pt. 5, p. 9, fig. 2, 1865 (type).—Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, p. 296, 1868 (Kandavu, Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 12, 1869 (Samoa, Viti).—Schmeltz: op. cit., vol. 5, p. 21, 1874 (Samoa; Viti; Tonga).

Holocentrus fuscostriatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 69, 1900 (1901) (type loc., Guam).—Seale: op. cit., vol. 1, no. 5, p. 17, 1902 (Honolulu).

The Wilkes Expedition obtained 2 from Samoa, 2 Fiji, and 1 Tahiti, now in the National Museum. Others are young from Tahiti, adult from Apia, received from W. H. Jones, May 15, 1883, 5 from Apia from Bureau of Fisheries, 7 Honolulu, 1 Laysan, 3 Suva, 5 Mangareva, 2 Fakarava, 1 Tuamotus. Twelve from Honolulu in the Bishop Museum, 3 French Frigates Shoal, 3 Wake Island, 4 Tahiti, 13 Raiatea, 1 Rarotonga, 1 Nukuhiva, 1 Shortland Island, and 30 types of *Holocentrus fuscostriatus* from Guam. Largest specimen 267 mm. In the Agassiz Museum 11 from Apia, 8 young from Pelew Islands, 10 from Society Islands obtained by Andrew Garrett, 2 Makemo, 2 from Rikitea on Mangareva, 1 Strong Island from Rev. B. G. Snow, adult and half-grown from the Kingsmill Islands obtained by Andrew Garrett. In the Academy 10 from Apia and 1 Hawaiian.

Indo-Pacific, Bourbon Island, Tahiti, Hawaii.

Holocentrus opercularis Valenciennes.

Holocentrum operculare Valenciennes: Hist. nat. Poiss., vol. 7, p. 377, 1831 (type loc., Carteret Harbor, New Ireland).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 100, pl. 66, fig. A, 1875 (Pelew Islands; Samoa; Friendly Islands; Tuamotus).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 11, 1877 (Vavau).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1375, 1906 (Upolu).

Holocentrus opercularis Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 24, 1906 (Tahiti).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 227, 1905 (1906) (Pago Pago).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 95, 1912 (Rikitea, Mangareva).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 10, 1925 (Wake Island).

Head 2 1/2; depth 3 2/5; D. XI, 13; A. III, 9, 1; P. 11, 12; V. I, 7; scales 37 in lateral line to caudal base and 4 more on latter; 4 scales above lateral line to spinous dorsal origin, 8 below to spinous anal origin; 8 predorsal scales; snout 3 in head measured from upper jaw tip; eye 3 3/5; maxillary 2 1/3; interorbital 5 1/3.

Body elongately fusiform, well compressed, profiles alike, deepest about midway in its length. Caudal peduncle slender, compressed, least depth half its length or 5 in total head length. Head attenuate, compressed, flattened sides even above and below, width 2 in its total length. Snout conic, width 2 in its length. Eye large, high, impinging on upper profile, hind pupil edge midway in head measured from upper jaw tip. Mouth large, lower jaw well protruded. Maxillary reaches opposite front pupil edge; expansion 2 in eye. Lips broad, coriaceous, fleshy. Teeth fine, villiform, in broad bands in jaws, on vomer and palatines. Interorbital level, with 2 longitudinal ridges extending to occiput. Preopercle spine slightly less than half of eye. Opercle with two wide-set subequal spines. Suprascapula serrate. Gill rakers v, 1 + 7, vi, longest 1 1/3 gill filaments or 3 1/2 in eye. Scales smaller along body edges; 40 small marginal apical denticles, basal elements in 2 or 3 rows and 4 basal marginal striae; circuli very fine; 5 rows of scales on cheek; small scales crowded about bases of soft dorsal and anal and many still smaller extending over most of caudal. Lateral line of small simple tubes, complete. Spinous dorsal origin about over that of pectoral, slightly nearer snout tip than caudal base, third spine 2 3/5 in head; fourth dorsal ray 2 1/2; third anal spine 2; first anal ray 2 1/8; caudal strongly forked, 1 2/3; pectoral 2; ventral 2.

Dull brownish generally, sides and lower surface pale. Spinous dorsal with broad, black, subterminal, longitudinal band, traces of brownish shade basally. All fins otherwise pale brownish.

One in the Bishop Museum from Tahiti, 262 mm. long. It differs a little from Günther's figure in that only the upper half of hind preopercle edge finely serrate, preopercle spine shorter, shorter third anal spine and base of spinous dorsal pale, though terminal margin of each membrane is whitish. In the National Museum an adult from Rikitea and a half-grown example from Samoa. The Wilkes Expedition obtained an example 135 mm. long at Samoa. In the Agassiz Museum 1 from the Society Islands 253 mm. long, obtained by Andrew Garrett. In the Bishop Museum 2 from Wake Island in 1923, length 280 mm.

Holotrachys lima (Valenciennes).

Myripristis lima Valenciennes: Hist. nat. Poiss., vol. 7, p. 371, 1831 (type loc., Mauritius).

Myripristis (*Holotrachys*) *lima* Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 93, pl. 63, fig. A, 1874 (Kingsmills; Samoa; Society Islands; Hawaiian islands).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 11, 1877 (Huahine).

Myripristis (*Holotrachis*) *lima* Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 492, 1901 (Honolulu).

Holotrachys lima Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 18, 20, 21, 1902 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 439, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 523, 1902 (1904) (Honolulu; Laysan).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 224, 1904 (Hawaii).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 147, pl. 4, 1903 (1905) (Honolulu; Hilo; Kailua; Samoa).—Steindachner: Akad. Wiss. Wien, Denk., vol. 115, pt. 1, p. 1374, 1906 (Upolu).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 116, 1922 (Pago Pago).—Fowler: Copeia, no. 112, p. 82, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 24, 1925 (Honolulu).

Myripristis humilis Kner and Steindachner: Akad. Wiss. Wien, Sitz., vol. 54, pt. 1, p. 357, pl. 1, fig. 1, 1866 (type loc., Samoa).

Eighteen from Honolulu in the Bishop Museum. I examined 15 specimens in the Honolulu markets in November and December, 1922. In the National Museum 4 from Honolulu, 1

Laysan, and 3 Apia. Three adults from the Hawaiian islands in the Agassiz Museum, also 1 obtained by Andrew Garrett. The largest specimen, 165 mm. long, was secured by Andrew Garrett in the Society Islands. One Hawaiian specimen in the Academy from J. K. Townsend.

Mauritius to Hawaii and Tahiti.

Myripristis murdjan (Forskål).

Sciaena murdjan Forskål: Descriptiones animalium, pp. 12, 48, 1775 (type loc., Arabia).

Myripristis murdjan Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 92, 1874 (Kingsmills; Hervey Islands; Society Islands; Paumotus; Hawaiian islands).—Peters: Akad. Wiss. Berlin, Wien, Monatsb., p. 835, 1876 (1877) (New Britain).—Günther: Rept. voyage "Challenger," vol. 1, p. 34, 1880 (Ovalau, Fiji).—Vaillant: Soc. Philom. Paris, Bull., 7th ser., vol. 11, p. 59, 1886-87 (Tahiti).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 372, 1897 (Rotuma).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 501, 1900 (Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 67, 1900 (1901) (Guam).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 492, 1901 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 440, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 523, 1902 (1904) (Laysan).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 152, pl. 5, 1903 (1905) (Honolulu; Hilo; Kailua; Laysan; Samoa).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 26, 1906 (Raiatea; Rarotonga; Tahiti; Faté).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1373, 1906 (Upolu; Savaii).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 220, 1905 (1906) (Samoa).—Fowler: Copeia, no. 122, p. 82, Nov. 20, 1922 (Hawaiian islands).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 6, 24, 31, 1925 (Guam, Honolulu, Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 10, 1925 (French Frigates Shoal, Johnston and Wake islands).—Fowler: op. cit., Bull. 38, p. 8, 1927 (Fanning Island).

Myripristis adustus (non Bleeker) Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 128, 1902 (1903) (Marcus Island).

Myripristis berndti Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 170, 1902 (1903) (type loc., Honolulu).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 222, 1904 (paratype).—Snyder: U. S. Fish Comm., Bull., vol. 22, p. 523, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 153, fig. 54, 1903 (1905) (Honolulu).

Five in the Bishop Museum from Honolulu, 3 French Frigates Shoal, 1 Johnston Island, 7 Wake Island, 1 Raiatea, 9 Tahiti, 4 Fatè, 5 Agaña on Guam, 2 Raratonga, 1 Shortland Island, and 1 Marcus Island. Largest 270 mm. The Marcus Island specimen shows the anterior dorsal and anal rays, besides the outer caudal, little darker than others. Pectoral axil black. Opercle border above finely dotted with dusky-brown, as seen under a lens, though the general effect is scarcely darker. Ventral with slightly deeper shade of brownish submarginally. No dark or blackish terminal borders to the fins, as shown in most figures of *Myripristis adustus*. I found over 1300 specimens in the Honolulu markets in November and December 1922 and January 1923. The National Museum contains 2 adults from Apia, obtained by W. H. Jones May 15, 1883, and 16 others from the Bureau of Fisheries. Also 7 Hawaiian specimens, the type of *Myripristis berndti*, and 2 from Tahiti. The Agassiz Museum has 2 from Strong Island, Caroline Islands, Rev. B. G. Snow; 13 from the Society Islands, Andrew Garrett; 3 from Honolulu obtained by W. H. Jones; 1 Honolulu from Bureau of Fisheries. Two from Hawaii and 7 from Samoa in the Academy.

Red Sea, East Africa, East Indies, Hawaii, Tahiti.

Myripristis violaceus Bleeker.

Myripristis violaceus Bleeker: Nat. Tijds. Ned. Ind., vol. 2, p. 234, 1851 (type loc., Neira, Banda).—Fowler: B. P. Bishop Mus., Bull. 38, p. 8, 1927 (Christmas Island).

Head 3; depth 2 1/5; D. X, I, 15, 1; A. III, 13; scales 28 in lateral line and 5 non-tubular large scales over caudal base; 4 scales above lateral line, 6 below, 8 predorsal; snout 4 7/8 in head measured from upper jaw tip; eye 2 1/3; maxillary 1 4/5; interorbital 3 3/5.

Body compressed, deeply ovoid. Caudal peduncle strongly compressed, least depth 1 1/3 in its length or 3 1/10 in total head length. Head width 1 2/3 in its length. Snout obtuse, convex, length 2/5 its width. Eye large, high, hind pupil edge midway in head length. Mouth large, mandible well protruded. Maxillary extends opposite eye center; expansion 2 1/8 in eye. Teeth in villiform bands in jaws, on vomer and palatines. Nostrils together, within front of last third of snout, close before eye and posterior 3 times size of anterior. Interorbital broadly convex. Edges of preorbital, infraorbital, preopercle, opercle, subopercle, interopercle and suprascapula finely serrate. Gill rakers 14 + 28, lanceolate, 2 1/6 in eye; gill filaments 2/3 of gill rakers. Scales finely spinescent, with 2 to 7 basal lobate points, giving place to as many radiating striae; apical denticles 55 to 67, irregular, uniserial to 4 irregular transverse series; circuli fine. Caudal largely covered with minute scales, little larger basally. Third dorsal spine 2 in head; first dorsal ray 1 1/3; third anal spine 2 1/5; first anal ray 1 1/3; caudal widely forked, 1; pectoral 1 1/4; ventral 1 2/5.

Back with dull drab-gray tints, sides and under surface bright brassy-whitish. Fins all dull brown, uniform. Iris pale, with silvery reflections. Length 175 mm.

In the Agassiz Museum 2 from the Society Islands, obtained by Andrew Garrett.

The dark upper edge of the opercular flap, as shown in Bleeker (Atlas ichth., vol. 9, pl. [3] 357, fig. 5, 1877) figure is little evident, though there is a deep brown blotch within the pectoral axil.

Myripristis adustus Bleeker (Pl. VI, *B*).

Myripristis adustus Bleeker: Nat. Tijds. Ned. Ind., vol. 4, p. 108, 1853 (type loc., Amboina).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 352, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 265, 1883 (Hood Bay, New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 26, 1906 (Tahiti; Shortland Island, Solomons).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 220, 1905 (1906) (Samoa).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 6, 31, 1925 (Guam; Samoa).—Fowler: B. P. Bishop Mus., Bull. 38, p. 8, 1927 (Christmas Island).

Myripristes adusta Schmeltz: Mus. Godeffroy, Cat. 4, p. 12, 1869 (Samoa).

Myripristis murdjan var. *adusta* Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 92, pl. 62, 1874.

Myripristis murdjan (non Forskål) Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 92, 1874 (part).

Three in the Bishop Museum from Tahiti. One in the National Museum from New Guinea and 6 from Apia. Three from Apia in the Agassiz Museum, 1 Gilbert Islands, and 2 Society Islands, both from Andrew Garrett. Largest 254 mm. Three in the Academy from Apia.

E. K. Jordan reports "the Bishop Museum contains a fine cast of this well-marked species, made from a specimen taken in the Honolulu market" (U. S. Nat. Mus., Proc., p. 9, 1925). Now in the collection of the Bishop Museum I found no specimen obtained in the Hawaiian islands. This cast is No. 240 and is 223 mm. long, but it was labeled Tahiti, and apparently refers to one of the three specimens just mentioned. In view of this uncertainty it seems best to withhold its admission to the Hawaiian ichthyfauna. I purposely refrained from publishing the record for this reason.

Zanzibar, East Indies, Samoa, Tahiti.

Myripristis macrolepis Bleeker.

Myripristis macrolepis Bleeker: Ned. Tijds. Dierk., vol. 4, p. 195, 1874 (type loc., Java; Nias, Celebes; Buru; Amboina).—Bleeker: Atlas ichth., vol. 9, pl. (5) 359. figs. 3, 1877.

One in the National Museum from New Guinea, 142 mm. long appears to be this species. Soft dorsal with 13 rays; scales 28 in lateral line to caudal base and 3 more on latter; third and fourth anal spines equal. It shows a deeper caudal peduncle and 2 more dorsal rays than Bleeker's figure.

East Indies.

Myripristis intermedius Günther.

Myripristis murdjan var. *intermedia* Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 92, 1874 (type loc., South Sea).

Myripristis intermedius Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 353, 1906 (Tahiti).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 220, 1905 (1906) (Samoa).—Fowler: B. P. Bishop Mus., Bull. 22, p. 31, 1925 (Samoa).

Eight Samoan specimens in the National Museum obtained by the Wilkes Expedition, largest 140 mm. One from Apia, by the Bureau of Fisheries. Six small specimens in the Agassiz Museum, from Apia. Six in the Academy from Apia.

Myripristis microphthalmus Bleeker.

Myripristis microphthalmus Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 261, 1852 (type loc., Amboina).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 265, 1883 (Hood Bay, New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 28, 1906 (Faté, New Hebrides).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 220, 1905 (1906) (Apia; Pago Pago).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 90, 1912 (Mangareva; Paumotus; Samoa).—Fowler: B. P. Bishop Mus., Bull. 22, p. 31, 1925 (Samoa).

Head 2 4/5; depth 2 1/5; D. X-I, 1, 14, 1; A. IV, 1, 12, 1; scales 28 in lateral line to caudal base and 3 more on latter; 3 scales above lateral line, 6 below; 8 predorsal scales; head width 1 2/3 its length; least depth of caudal peduncle 3 1/8; snout 4 1/3 in head measured from upper jaw tip; eye 2 1/6; maxillary 1 5/6; interorbital 3 1/2. Gill rakers 13+26, lanceolate. twice gill filaments on half of eye. Scales with 4 basal radiating striae, 2 median approximated; apical denticles 25, strong, graduated medianly to largest. Maxillary extends 3/5 to eye.

Two in the Bishop Museum from Faté, 133 and 136 mm. long. In the National Museum 1 Mangareva, 8 Apia, 2 Rikitea. Three small specimens in the Agassiz Museum from Apia. Three in the Academy from Apia.

East Indies to Samoa.

Myripristis hexagonus (Lacépède) (fig. 21).

Lutjanus hexagonus Lacépède: Hist. nat. Poiss., vol. 4, pp. 180, 213, 1802 (no type locality; "Collection donnée par la Hollande à la France").

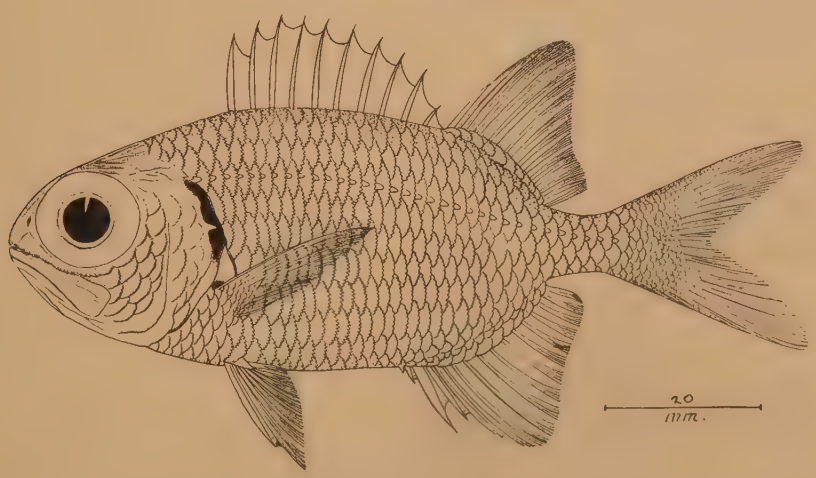

FIGURE 21.—Drawing of *Myripristis hexagonus*.

Myripristes hexagonus Schmeltz: Mus. Godeffroy, Cat. 4, p. 12, 1869 (Samoa; Viti).

Myripristis hexagonus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 221, 1905 (1906) (Apia).

Head 2 7/8; depth 2 1/3; D. X, I, 15; A. IV, 13; P. II, 13; V. I, 7; scales 32 in lateral line to caudal base, 1 more (tubular) on latter; 3 scales above lateral line, 7 below, 9 predorsal; snout 5 in head; eye 2 1/10; maxillary 1 7/8; interorbital 3 1/2.

Body compressed, ovoid, deepest at front of spinous dorsal. Caudal peduncle strongly compressed, least depth 1 1/3 in its length or 3 3/4 in head. Head width 1 4/5 in its length. Snout very obtuse, convex, length 1/3 its width. Eye high, slightly impinging on upper profile; diameter greatly exceeds snout or interorbital. Mouth rather large, closed jaws even. Maxillary reaches opposite hind pupil edge; expansion 2 2/5 in eye. Teeth in villiform bands in jaws, on vomer and palatines. Nostrils close together, close before eye; hind nostril vertical slit 1/3 of pupil. Interorbital level. Edges of suborbitals, preopercle, opercle, subopercle and interopercle finely serrate; broad short spine at opercle angle. Gill rakers 13+25, finely lanceolate, 2 1/2 in eye or twice length of gill filaments. Scales with scarcely basal knob; basal striae 39 or 40, parallel and vertical; apical denticles 42 to 45, in 2 or 3 transverse series. Lateral line slopes evenly from shoulder to middle of caudal base; tubes simple, each large and well exposed. Fourth dorsal spine 2 1/4 in head; spine of soft dorsal 3 1/6; third branched dorsal ray 1 1/2; third anal spine 2 4/5, third branched anal ray 1 2/3; caudal widely forked, slender, pointed lobes 1 1/5; pectoral 1 1/4; ventral 1 1/2.

Body with back brownish, sides and below whitish with silvery reflections. Iris whitish. Fins all pale brownish, uniform. Upper hind edge of gill opening brown. Pectoral axil deep brown. Length 100 mm.

In the Agassiz Museum 1 from the Society Islands obtained by Andrew Garrett. Also 1 from the Kingsmills, 203 mm., obtained by Andrew Garrett. The National Museum has 1 from Apia.

Quoy and Gaimard's figure shows a rather large opercular spine as in my example and the second anal spine slightly longer than the third. Its pectoral is figured yellow, a character which may separate it from *Myripristis murdjan*.

Distributed from Mauritius to the East Indies and Samoa.

Myripristis chryseres Jordan and Evermann.

Myripristis chryseres Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 171, 1902 (1903) (type loc., Hilo; Honolulu).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 224, 1904 (paratype).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 150, pl. 6, 1903 (1905) (types).—Fowler: Copeia, no. 112, p. 82, Nov. 20, 1922 (Hawaiian islands).—Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., 4th ser., vol. 16, p. 653, Nov. 14, 1927 (Honolulu).

Ten in the Bishop Museum from Honolulu. Largest 235 mm. These all show the anal with 4 spines and 11 to 13 rays, usually the last number. In the largest fresh specimen the opercular border deep blood-red, though the pectoral axil not especially red. General body-color crimson. Dorsals, anals, and caudal bright yellow, narrowly bordered with red. Pectoral red. Ventral yellow, with front and hind edges red. These colors fade in alcoholic material, usually leaving the upper opercular border dusky to blackish. Four in the National Museum from Honolulu, including the type of *Myripristis chryseres*. In the Agassiz Museum 1 from Hilo 240 mm. long. One in the Academy from Honolulu. I also examined 76 specimens in the Honolulu markets in December 1922.

If *M. chryseres* is really distinct from *Myripristis praslinus* Cuvier, the only characters set forth by Jordan and Evermann would be the red fin of their *Myripristis symmetricus* (=*Myripristis praslinus*). *Myripristis violaceus* Bleeker (Atlas ichth., vol. 9, pl. [3] 357, fig. 5, 1877) from the East Indies may be the same as *Myripristis chryseres*. Though its fins are shown yellowish-brown the black opercular border is very pronounced.

Myripristis argyromus Jordan and Evermann.

Myripristis argyromus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 172, 1902 (1903) (type loc., Hilo; Honolulu).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 224, 1904 (J. K. Townsend's specimen).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 154, pl. 27, fig. 55, 1903 (1905) (types)

Myripristis argyrommus Fowler: Copeia, no. 122, p. 82, Nov. 20, 1922 (Hawaiian islands).

Myripristis murdjan (non Forskål) Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 501, 1900 (Hawaiian islands).

One in the Academy from the Hawaiian islands, obtained by J. K. Townsend. The type of *Myripristis argyromus* in the National Museum. One specimen, 209 mm. long, in the Agassiz Museum, from Honolulu.

Possibly this is the *Myripristis axillaris* Valenciennes (Hist. nat. Poiss., vol. 7, p. 369, 1831, Mauritius).

Myripristis praslinus Cuvier.

Myripristis praslinus Cuvier: Hist. nat. Poiss., vol. 3, p. 127, 1829 (type loc., New Ireland).—Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 222, 1830 (Port Praslin, New Ireland).—Bleeker: Soc. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 17, 18, 20, 1902 (Honolulu).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1374, 1906 (Upolu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 222, 1905 (1906) (Apia).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 90, 1912 (Cook Bay, Easter Island; types of *Myripristis sanguineus* and *Myripristis symmetricus*).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 10, 1925 (French Frigates Shoal).—Fowler: op. cit., Bull. 38, p. 8, 1927 (French Frigates Shoal).

Myripristis praslinius Thiollière: Fauna Woodlark, p. 148, 1857 (Woodlark Island).

Myripristis kuim (Montrouzier) Thiollière: Fauna Woodlark, p. 148, 1857 (name in synonymy).

Myripristis symmetricus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 173, 1902 (1903) (type loc., Hilo; Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 151, pl. 26, 1903 (1905) (types).

Myripristis sanguineus (Jordan and Seale) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 26, fig. 7, 1906 (type loc., Tahiti; Apia).—Jordan and Seale: (U.

S.) Bur. Fish., Bull., vol. 25, p. 221, fig. 24, 1905 (1906) (Apia).

Myripristis phaeopus Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 28, fig. 8, 1905 (1906) (type loc., Nukuhiva, Marquesas Islands).

Head 3 1/8 to 3 1/6; depth 2 2/5 to 2 1/2; D. X-I, 13, 1 to 17, 1; A. IV, 13, 1 to 15, 1; scales 35 to 40 in lateral line to caudal base and 5 or 6 more on latter; 3 or 4 scales above lateral line, 7 below; 10 predorsal scales; snout 4 to 4 1/5 in head from upper jaw tip; eye 2 1/2 to 2 2/3; maxillary 2; interorbital 2 3/4 to 3 2/3. Body deeply ellipsoid in contour. Head deep, well compressed, sides flattened, width 1 1/2 to 1 7/8 its length. Snout obtuse, length about half its width. Gill rakers 12 to 14 + 24 to 26, lanceolate, equal or little longer than gill filaments or 2 to 2 1/2 in eye. Scales with 3 low basal lobes; apical denticles 24 to 93, graduated smaller from median; parallel vertical striae basally fine. Pectoral axil and opercle edge above blackish.

In the Bishop Museum the types of *Myripristis sanguineus,* 2 specimens from Tahiti, 235 mm.; type of *Myripristis phaeopus* from Nukuhiva, 64 mm., and 1 from French Frigates Shoal in 1923. In the National Museum the type of *Myripristis symmetricus* from Hawaii, 1 from Apia, and 5 from Cook's Bay on Easter Island.

Myripristis pahudi Bleeker.

Myripristis pahudi Bleeker: Akad. Amsterdam, Verslagen, vol. 15, p. 22, 1863 (type loc., Hitu, Amboina).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

Head 3; depth 2 1/4; D. X, I, 14 or 15; A. IV, 12 or 13; scales 37, above 3, below 6; snout 4 1/4 in head from upper jaw tip; eye 2 7/8; maxillary 2. Body and fins red with 8 or 9 pale rosy longitudinal bands. Length 146 to 183 mm. (Bleeker).

East Indies.

Myripristis carneus Ramsay and Ogilby.

Myripristis carneus Ramsay and Ogilby: Linn. Soc. New South Wales, Proc., 2nd ser., vol. 1, p. 474, 1886 (type loc., Admiralty Islands).

Head 2 9/10 in total length; depth 2 4/5; D. XII, 15; A. IV, 11; scales 36, above 4, below 9; snout 3 4/5 in head, equals eye; maxillary reaches behind middle of eye; interorbital 6 in head. Uniform red. Length 140 mm. (Ramsay and Ogilby)

Myripristis sealei Jenkins.

Myripristis sealei Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 439, fig. 13, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 151, 1903 (1905) (type).

Although *Myripristis sealei* is said to have 13 anal rays, in many other respects it approaches *Myripristis carneus.*

Type of *Myripristis sealei* from Honolulu, in the National Museum.

Myripristis leiognathos Valenciennes.

Myripristis leiognathos Valenciennes: Voyage "Venus," vol. 5, p. 316, pl. 4, fig. 1, 1846 (type loc., New Ireland).

Head 2 4/5; depth 2 1/2; D. XI, I, 12; A. IV, 13; scales 38; snout 5 in head from upper jaw tip; eye 2 1/2; maxillary 2, reaches opposite hind pupil edge. Red, with gold reflections. Length 165 mm. (Valenciennes)

Myripristis parvidens Cuvier.

Myripristis parvidens Cuvier: Hist. nat. Poiss., vol. 3, p. 129, 1829 (type loc., Port Praslin, New Ireland).

Head 2 3/4; depth 2 2/5; D. X, I, 14 or 15; A. III, 13 or 14; scales 30, above 3, below 6; snout 6 in head from snout tip; eye 2 1/4; maxillary 1 7/8, reaches opposite hind pupil edge. Violet red. Fins rosy or red, outer caudal rays violet. Opercular membrane and pectoral axil with black blotch. Length 98 to 103 mm. (Bleeker)

Myripristis multiradiatus Günther (Pl. VI, *C*).

Myripristis multiradiatus Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 93, 1874 (type loc., Vavau, Tonga Islands).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 439, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 523, 1902 (1904) (Laysan).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 149, 1903 (1905) (Honolulu; Hilo).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 222, 1905 (1906) (Pago Pago).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 93, 1912 (Rikitea; Mangareva; Honolulu).—Fowler: Copeia, no. 112, p. 82, Nov. 20, 1922 (Hawaiian islands).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 6, 31, 1925 (Guam; Samoa).

Two in the Bishop Museum from Honolulu. I found 50 in the Honolulu markets on January 12, 1923.

In the National Museum 1 from New Guinea, 9 Hawaiian, 7 Apia, 1 Rikitea. In the Agassiz Museum 2 small ones from Apia, 1 Hawaiian, and young one obtained by W. H. Jones at Honolulu, April 27, 1874. Five Hawaiian specimens in the Academy.

Harpage rosea De Vis.

Harpage rosea De Vis: Linn. Soc. New South Wales, Proc., vol. 8, p. 447, 1883 (type loc., South Sea Islands).

Head 3 1/3 in total; depth 2 3/4; D. XII, I, 14; A. III, 11; V. I, 7; lateral line 42, transversely 5 above, 10 below; snout 4 1/2 in head; orbit 3 1/2; interorbital 5 3/4.

Body moderately thick, elevated; profile regular, more convex above. Muzzle short, gape rather oblique, jaws equal. Premaxillary reaches much beyond orbit, very deep posteriorly and overhangs mandible. Teeth villiform, in jaws, on vomer, palatines, and tongue. Opercles distinctly serrated, with short spine distinct from serration; preopercle scarcely spiniferous, with short bifid spine at angle. Branchiostegals 5. Scales ctenoid, larger and more distinct anteriorly than posteriorly, anterior ones with 6 or 7 rather long teeth. Cheek and opercle sharply granular. Lateral line almost obsolete on caudal peduncle. Dorsals slightly connected, profile of spinous fin regularly arched, fourth to sixth spine longest, lower than soft fin. Dorsal, anal and caudal lobes obtusely pointed, last small. Second anal spine much longer and stronger than third. Ruddy-brown, stained with red. Fins pale. Length 126 mm. (De Vis)

SOLENOSTOMIDAE

Solenostomus cyanopterus Bleeker.

Solenostoma cyanopterum Bleeker: Nat. Tijds. Ned. Ind., vol. 6, p. 507, 1854 (type loc., Wahai, Ceram).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 428, 1910 (notes Bleeker's locality as misprint for Wahai in Ceram).

Solenostomus cyanopterus Duméril: Hist. nat. Poiss., vol. 2, p. 497, 1870 (New Guinea).

Caudal peduncle rather higher than long; caudal membrane begins very near or almost close to second dorsal and anal; length 152 mm. (Weber and Beaufort)

Red Sea, Zanzibar, East Indies, China, New Guinea.

Solenostomus armatus Weber.

Solenostomus armatus Weber: Siboga Exped., vol. 65, p. 103, fig. 33c, 1913 (type loc., S. Lat. 2° 35′ 5, E. Long. 131° 66′ 2 in 95 m.; New Guinea).

Caudal peduncle about thrice longer than high; caudal membrane begins at distance from second dorsal and anal, which longer than base of these fins; length 80 mm. (Weber and Beaufort)

Arafura Sea.

SYNGNATHIDAE

The species *Leptonotus blainvilleanus,* from the west and southern coasts of South America has been recorded by Duméril (Hist. nat. Poiss., vol. 2, p. 581, 1870, from Oceania?). As no subsequent observer has met with it in Oceania and in view of Duméril's doubt about his own record, it is omitted.

SYGNATHOIDINAE

Brood organ abdominal, eggs attached to abdominal skin and not protected by lateral cutaneous folds or bony plates.

Syngnathoides biaculeatus (Bloch).

Syngnathus biaculeatus Bloch: Nat. ausländischen Fische., vol. 1, p. 10, pl. 121, figs. 1-2, 1785 (type loc., East Indies).

Gastrotokeus biaculeatus Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 98, 1860 (New Guinea).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 5, 1859 (Dorey, New Guinea).—Bleeker: Akad. Amsterdam, Verslagen. 2nd ser., vol. 2, p. 281, 1868, p. 298, (Dorey, Waigiu).—Alleyene and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 354, 1876 (Hall Sound, New Guinea).—Bleeker; Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 6, p. 300, 1881 (south coast of New Guinea).—Macleay: op. cit., vol. 8, p. 279, 1883 (southeast New Guinea).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 215, 1905 (1906) (Apia and Pago Pago).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 434, 1919 (Samoa; Yap).—Duncker: Mus. Hamburg, Mitt., vol. 32, p. 38, 1915 (Indo-Pacific).—Fowler: B. P. Bishop Mus., Bull. 22, p. 7, 1925 (Guam).—Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 41, p. 11, 1925 (north coast of New Mecklenburg; Linden Harbor, south coast, Rein Bay and Hanam Harbor, New Pommerania; east of Long Island to New Guinea).

Gasterotokeus biaculeatus Castelnau: Zool. Acclimat. Soc. Victoria, Proc., vol. 2, p. 120, 1873 (Noumea, New Caledonia).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 38, 1874 (Tonga Islands).—Weber: Siboga Exped., vol. 65, p. 118, 1913 (Atjatuning, west coast of New Guinea).

Head 3 to vent; depth 3 1/8 in head; D. 42; A. 4; P. 19; snout 1 2/3 in head; eye 8 1/2; maxillary 10; interorbital 10 1/4; rings 17+46.

Body robust, greatest depth 2/3 its greatest width, concave sides approximated above so upper lateral keel fuses with lower lateral keel close behind dorsal fin; trunk with 3 median inferior keels of which each outer one continues below dorsal to form lower lateral keel of tail. Head width 4 3/5 in its total length. Snout well compressed, width 5 1/3 in its length, twice length of postorbital part of head. Front eye edge at least 2/5 in head; diameter 5 in snout, little greater than interorbital. Mouth small, superiorly terminal. Teeth not evident. Nostrils close together, anterior 2/3 an eye diameter before eye. Interorbital concave. Opercle without keels, radially striate. Spinous knob on supraorbital posteriorly. Rather strong occipital knob. Rings transversely striate. Dorsal on 1 trunk and 9 caudal rings. Pectoral 1 1/4 in eye, base broad, 1 2/3 in snout. Tail long as combined trunk and postocular region of head.

Body uniformly dull brown. Length 215 mm.

In the Agassiz Museum 1 from Ascension Island, Marshall Islands, obtained by Rev. L. H. Gulick. Adult in the National Museum from Samoa. One received in 1920 and credited to the Hawaiian islands is questionable.

Acanthognathus dactyliophorus (Bleeker).

Syngnathus dactyliophorus Bleeker: Nat. Tijds. Ned. Ind., vol. 4, p. 506, 1853 (type loc., Batavia, Onrust Island, Java).

Microphis dactylophorus Duméril: Hist. nat. Poiss., vol. 2, p. 592, 1870 (New Caledonia).

Doryichthys dactylophorus Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 433, 1910 (type loc., Pelew Islands).

Acanthognathus dactylophorus Duncker: Mus. Hamburg, Mitt., vol. 32, p. 41, 1914 (1915) (Marshall Islands; New Guinea).

Acanthognathus dactyliophorus Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 41, p. 12, pl. 2, fig. 1, 1925 (Friedrich Wilhelm Harbor, New Guinea).

Distinguished from *Syngnathoides biaculeatus* by the compressed trunk, large caudal fin and non-prehensile tail. Length 161 mm.

East Indies, Pelew Islands, Marshalls and New Caledonia.

DORYRHAMPHINAE

Brood organ abdominal, eggs attached to abdominal skin and laterally protected by bony plates or cutaneous folds only, which coalesce during breeding.

Choeroichthys sculptus (Günther).

Doryichthys sculptus Günther: Cat. fishes Brit. Mus., vol. 8, p. 185, 1870 (type loc., Fiji).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 374, 1807 (Rotuma Island).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 433, pl. 167, fig. a-a^1, 1910 (type; Rotuma).

Choeroichthys sculptus Duncker: Mus. Hamburg, Mitt., vol. 32, p. 59, 1914 (1915) (New Hebrides).

Head 3 1/6 to vent; depth 2 2/5 in head; D. 30; A. 4; P. 21; snout 2 1/8 in head measured from upper jaw tip; eye 6; maxillary 6; interorbital 8; rings 19 + 23.

Body compressed, deeper than wide; upper keel of trunk continuous with that of tail; second upper lateral keel of trunk continuous with medio-lateral keel of tail; third lateral keel of trunk median in position, drops below dorsal to become continuous with lowermost lateral keel of tail; trunk with 2 infero-lateral parallel keels of trunk, not joined behind. Head width 3 in its length. Snout compressed, width 3 1/3 in its length. Eye with front pupil edge midway in head; diameter 2 1/3 in snout. Mouth small, terminally superior. Interorbital slightly concave, with slight superciliary keel over each eye, extending back to suprascapular region. Slight median rostral keel superiorly. Opercle with median horizontal keel and radiating keels below and above; also postocular keel. Brood pouch abdominal, before vent. Keels all strongly developed, each ending with strong posterior spine, especially those bordering back and upper and lower edges of tail. Rings all rugosely-striate. Dorsal on 6 trunk and 2 caudal keels, fin moderate, height little less than eye. Caudal half of snout, rounded behind. Pectoral broad.

Body mostly uniform brownish, fins pale. Horizontal brown band along side of snout, through eye and across opercle until above pectoral base, above short parallel

narrow band or streak along side of occiput. Two dark spots below eye. On trunk traces of 3 rows of whitish spots within lower 4 keels of trunk. Obscure dark spots irregularly along side of back. Length 56 mm.

In the Agassiz Museum 1 from the Society Islands, obtained by Andrew Garrett.

Gunther's figure does not show the very small anal.

Ranges from East Africa to the Philippines, Japan, Fiji and Society Islands.

Coelonotus liaspis (Bleeker).

Syngnathus liaspis Bleeker: Bataviaasch Genoot., Verh. (Trosk. Vissch.), vol. 25, p. 20, 1853 (type loc., Batavia, Java).

Coelonotus leiaspis Beaufort: Dierk. Amsterdam, Bijd., vol. 19, p. 103, fig. 3, 1913 (Rabiai, Waigiu).

Syngnathus budi Weber: Nova Guinea, vol. 5, pt. 2, p. 228, 1908 (Klipong River, northern New Guinea).

Rings 17 or 18 + 32 to 34; D. 51 to 60; A. 4; P. 17 to 10. Length 146 mm. (Duncker)

Madagascar, East Indies, Philippines, Japan.

Coelonotus platyrhynchus (Duméril).

Syngnathus platyrhynchus Duméril: Hist. nat. Poiss., vol. 2, p. 571, 1870 (type loc., Nukuhiva, Marquesas Islands).

Coelonotus platyrrhynchus Duncker: Mus. Hamburg, Mitt., vol. 32, p. 56, 1914 (1915) (New Pommerania).—Duncker and Mohr: op. cit., vol. 41, p. 15, pl. 2, fig. 3, 1925 (Zoller Bay, New Pommerania).

Rings 16 or 17 + 36 or 37; D. 46 to 50; A. 3; P. 16 or 17. Length 108 mm. (Duncker)

Bismark Archipelago, Marquesas Islands.

Doryrhamphus melanopleura (Bleeker).

Syngnathus melanopleura Bleeker: Nat. Tijds. Ned. Ind., vol. 15, p. 464, 1858 (type loc., Nova Semla, Cocos Islands, Indian Ocean).

Doryrhamphus melanopleura Duncker: Mus. Hamburg, Mitt., vol. 32, p. 61, 1914 (1915) (northern New Guinea).—Duncker and Mohr: op. cit., vol. 41, p. 15, 1925 (Dörperspitze, New Guinea).

Doryichthys pleurotaenia Günther: Rept. voyage "Challenger," vol. 1, p. 62, pl. 26, fig. D, 1880 (type loc., Honolulu).—Snyder: U. S. Fish Comm., Bull., vol. 22, p. 523, 1902 (1904) (Honolulu).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 434, 1910 (Rotuma).

Doryrhamphus pleurotaenia Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1419, 1906 (Samoa).

Trunk rings more numerous than tail rings, 16 to 18 + 13 to 15; D. 21 to 25, greater portion on trunk or rings 4 to 6 + 2 to 4; caudal more than half of head; vent behind middle in body. Length 61 mm.

Small specimen in the National Museum, from Tutuila, Samoa, obtained by Lieut. R. C. Reed, January 3, 1921.

Mauritius, East Indies, Japan, Samoa, Hawaii.

Doryrhamphinarum brachyurum (Bleeker) (fig. 22).

Syngnathus brachyurus Bleeker: Bataviaasch Genoot., Verh. (Trosk.), vol. 25, p. 16, 1853 (type loc., Batavia. Panimbang, western Java; Priaman, western Sumatra).

Doryichthys brachyurus Günther: Cat. fishes Brit. Mus., vol. 8, p. 184, 1870 (Polynesia; Aneiteum).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 38, 1874 (Rarotonga; Viti Islands).—Günther: Rept. voyage "Challenger," vol. 1, p. 36, 1880 (Ovalau, Fiji).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 433, 1910 (Aneiteum; Ovalau; Huahcine; Vavau; Rarotonga; Samoa).—Weber: Nova Guinea, vol. 5, pt. 2, p. 228, 1908 (Klipong River, northern New Guinea).—Weber: Nova Guinea, vol. 9, pt. 4, p. 552, 1913 (Mbai River and Faté River, northern New Guinea).

Microphis brachyurus Duméril: Hist. nat. Poiss., vol. 2, p. 595, pl. 26, fig. 4, 1870 (Tahiti).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 214, fig. 20, 1905 (1906) (Vaisigano River and Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 264, 1911 (Kusaie, Carolines).—Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 41, p. 13, 1925 (north coast of Bird Island Bay, Admiralty Islands; Pulie Bay, Möve Harbor, Henry Reid Bay, Zoller Bay and Massava Harbor, New Pommerania; Langermak Bay, Friedrich Wilhelm, Potsdam and Kelana Harbors, Dorperspitz and Kaiser Augusta River, New Guinea).

Doryrhamphinarum brachyurum Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 442, 1921 (Tahiti).—Fowler: B. P. Bishop Mus., Bull. 22, p. 37, 1925 (Tahiti).

Doryichthys hasselti Kaup: Cat. Lophobr. fishes, p. 57, 1856 (type loc., Java; Tahiti).

Microphis jouani Duméril: Hist. nat. Poiss., vol. 2, p. 592, 1870 (type loc., fresh waters of New Caledonia).

Trachyrhamphus sp. Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 17, 1906 (Marquesas Islands).

Head 2 3/4 to 3 1/8 in vent; depth 5 1/5 to 5 7/8; D. 39 or 40; A. 3; P. 22; snout 1 1/2 to 1 3/5 in head measured from upper jaw tip; eye 9 1/5 to 9 1/4; maxillary 13 1/5 to 14; interorbital 13 to 16 1/2; rings 21 or 22 + 23.

Body robust, slightly wider than deep or but little compressed; upper keel of trunk not extending beyond dorsal fin; upper keel of tail begins little before dorsal fin on same ring, then continues along upper side of tail; median lateral keel of trunk slopes down opposite dorsal origin and continues with lower keel of tail; lower keel of trunk extends over first 2 caudal rings but not continuous with lower caudal keel; median ventral keel of trunk continues to vent. Head width 7 to 7 4/5 in its total length. Snout well compressed, width 6 1/4 to 7 4/5 in its length. Eye 5 1/4 to 5 4/5 in snout, more than twice interorbital; front edge at last third in total head length. Mouth very small, superiorly terminal. No teeth. Interorbital concave. Strong median horizontal keel across opercle and 4 weak radiating keels below. Slight median rostral keel extends to front of interorbital and parallel each side supero-lateral similar keel, which extends over midde of superciliaries. Keels on body all strongly developed, each edge finely serrated and each ring with small detached spine behind. Rings each with parallel fine transverse or vertical striae. Dorsal on 1 trunk and 8 caudal rings, height 1 to 1 1/2 in eye. Caudal 3 3/4 to 4 1/3 in total head length. Pectoral broad, slightly greater than eye.

FIGURE 22.—Drawing of *Doryrhamphinarum brachyurum*.

Pale brown generally, variegated and marbled with darker. Along side of head and body, beginning on side of snout, through eye, across opercle and along upper side of trunk above median lateral keel, dark brown band. Dorsal pale. Caudal dusky. Length 125 to 135 mm.

In the Agassiz Museum 2 from Kusaie, Carolines, 4 from the Society Islands, and 7 from

Samoa. Eleven specimens in the Academy from Tahiti.

The anterior half of the specimen from Nukuhiva which Alvin Seale thought may be a new species allied with *Trachyrhamphus longirostris* Kaup, is in the Bishop Museum. The horizontal opercular keel is complete and 3 others radiate completely below. Muzzle marked with whitish blotches of variable size. Deep brown streak extends through eye along side of head and on upper side of trunk.

Indo-Pacific from East Africa, India, East Indies, Japan, Tahiti.

Doryrhamphinarum manadensis (Bleeker).

Syngnathus manadensis Bleeker: Soc. Sci. Ind. Neerl. Act. (Manado), vol. 1, p. 78, 1856 (type loc., Celebes).

Microphis manadensis Duncker: Mus. Hamburg, Mitt., vol. 32, p. 47, 1914 (1915) (German New Guinea).—Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 41, p. 14, 1925 (Langermak Bay, New Guinea).

Doryichthys bernsteini Weber: Nova Guinea, vol. 5, pt. 2, p. 229, 1908 (Mamapiri, northern New Guinea).

Differs from *D. brachyurum* in shorter snout, much less than twice postorbital length.

East Indies, Philippines, Queensland.

Doryichthys retzii (Bleeker).

Syngnathus retzii Bleeker: Soc. Sci. Ind. Neerl. Act. (Manado), vol. 1, p. 76, 1856 (type loc., Manado, in fresh water).—Weber: Nova Guinea, vol. 5, pt. 2, p. 228, 1908 (Manupiri, northern New Guinea).

Doryichthys retzii Duncker: Naturh. Mus. Hamburg, Mitt., vol. 32, p. 50, 1915 (Bismark Archipelago).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 4, p. 52, fig. 23, 1922 (caudal fin) (Waigiu and New Guinea).—Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 41, p. 14, 1925 (north coast Admiralty Islands; Möve Harbor, Henry Reid Bay and Zoller Bay, New Pommerania; Langemak Bay and Dorperspitz, New Guinea).

Microphis caudatus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 214, fig. 21, 1905 (1906) (Gasegase River near Apia).

Doryichthys caudatus Weber: Nova Guinea, vol. 5, pt. 2, p. 228, 1908 (Klipong River, northern New Guinea).—Weber: op. cit., vol. 9, pt. 4, p. 552, 1913 (Mbai River and Lorentz River at Bivak Island).

Doryrhamphus caudatus Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 103, 1913 (Waihå, Waigiu).

Microphis torrentius Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 215, fig. 22, 1905 (1906) (type loc., Vaivase River near Vailele, Samoa).

Rings 16 or 17 + 28 to 31; D. 34 to 40, on 1 or 2 + 7 or 8 rings; snout equals or somewhat shorter than postorbital. Length 115 mm.

Two in the National Museum from Samoa.

The genus *Dorrichthys* differs from *Doryrhamphinarum* in the premedian vent.

East Indies to Samoa.

Doryichthys caudocarinatus Weber.

Doryichthys caudocarinatus Weber: Nova Guinea, vol. 5, pt. 2, p. 229, 1908 (type loc., Tawarin River, New Guinea).

Rings 20 + 28; D. 42, on 2 + 8 rings. Length 72 mm. (Weber and Beaufort)

Both *D. retzii* and *D. spinachioides* have the lower trunk and tail keel discontinuous.

Doryichthys spinachioides Duncker.

Doryichthys spinachioides Duncker: Mus. Hamburg, Mitt., vol. 32, p. 52, 1915 (type loc., Kaiserin Augusta River, New Guinea).—Duncker and Mohr: op. cit., vol. 41, p. 15, pl. 2, fig. 2, 1925 (Kaiserin Augusta River).

Rings 16 + 27; D. 66, on 6 + 6 rings. Length 82 mm. (Duncker)

SOLEGNATHINAE

Brood organ subcaudal, eggs attached to anterior ventral surface of tail, open and not protected by lateral bony plates or cutaneous folds.

Solegnathus lettiensis Bleeker.

Solenognathus lettiensis Bleeker: Soc. Sci. Ind. Neerl. Act. (Amboina), vol. 8, p. 3, 1860 (type loc., Letti).

Solenostomus paradoxus (non Pallas) Kaup: Cat. Lophobr. fishes, p. 2, 1856 (New Guinea).

Rings 22 or 23+50 or 51; D. 35 or 36, entirely over 10 caudal rings. Length 312 mm. (Weber and Beaufort)

East Indies.

SYNGNATHINAE

Brood organ subcaudal, eggs attached to ventral surface of anterior portion of tail, laterally protected by osseous plates or cutaneous folds only, which coalesce during breeding.

Stigmatophora argus (Richardson).

Syngnathus argus Richardson: Zool. Soc. London, Proc., vol. 8, p. 29, 1840 (type loc., Tasmania).

Stigmatophora argus Kaup: Cat. Lophobr. fishes, p. 53, 1856 (New Guinea).—Günther: Cat. fishes Brit. Mus., vol. 8, p. 189, 1870 (type).—Duméril: Hist. nat. Poiss., vol. 2, p. 583, 1870 (Oceania).

No caudal; body depressed or subcylindrical; tail filiform, but not prehensile; head not elevated, without spines. Length 205 mm.

Four faded specimens in the National Museum labeled Oceania, received from the Paris Museum.

The New Zealand *Stigmatophora macropterygia* Duméril (Hist. nat. Poiss., vol., 2, p. 583, 1870) was described from "Oceania."

New Guinea, Australia, Tasmania.

Haliichthys taeniophorus J. E. Gray.

Haliichthys taeniophorus J. E. Gray: Zool. Soc. London, Proc., vol. 27, p. 39, pl. 7, 1859 (type loc., Freycinet Harbor, Shark's Bay, western Australia).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 4, p. 106, fig. 44, 1922 (south New Guinea).

Phyllopteryx taeniophorus Weber: Zool. Forsch. Australien (Semon), vol. 5, p. 275 (115), 1895 (coast of New Guinea).

Differs from *Stigmatophora argus* in the compressed body, prehensile tail, and compressed head with broad crest on occiput and neck furnished with strong spines. Length 300 mm.

South New Guinea, North and West Australia.

Ichthyocampus kampeni Weber.

Ichthyocampus kampeni Weber: Siboga Exped., vol. 65, p. 114, fig. 40, 1913 (type loc., Bco, Karakalang Island; Lirimg, Salibabu Island; Atjatuning, western New Guinea; Amboina).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 4, p. 93, fig. 38, 1922 (types).

Median trunk keel ends at third to 16th or 17th

caudal ring; keel only on front third of opercle: posterior tail rings with sharp edges and ending in sharp tooth. Length 58 mm.

I follow Weber and Beaufort in separating this species from *Ichthyocampus belcheri* Kaup.

East Indies.

Ichthyocampus erythraeus Gilbert.

Ichthyocampus erythraeus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 613, fig. 238, 1903 (1905) (type loc., off Molokai, 23 or 24 fathoms).

D. 22; rings 16 + 36, shown on 2 body and 3 caudal rings; median lateral keel not extending on caudal rings; brick-red. Length 55 mm. (Gilbert)

Possibly the young of *Ichthyocampus carce* (Buchanan-Hamilton).

Syngnathus spicifer Rüppell (fig. 23).

Syngnathus spicifer Rüppell: Neue Wirbleth. Fisch., p. 143, pl. 33, fig. 4, 1835 (type loc., Tor, Red Sea).—Weber: Nova Guinea, vol. 5, pt. 2, p. 228, 1908 (Klipong River, northern New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 429, 1910 (Pelew Islands; Vavau).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 102, 1913 (Rabiai, Waigiu).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 4, p. 80, 1922 (Doreh, Klipong River and British New Guinea).—Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 41, p. 17, pl. 2, fig. 4, 1925 (Möve Harbor, Jacquinot Bay, Hanam Harbor, Rein Bay and west coast, New Pommerania; Friedrich Wilhelm Harbor and Dörperspitz, New Guinea).

Corythroichthys spicifer Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 264, 1911 (Kusaie, Carolines).

Syngnathus gastrotaenia Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 281, 1868 (Dorey, New Guinea).

D. 25 to 31, over second to ninth caudal rings; rings 14 to 16 + 37 to 42; opercle with complete keel. Length 154 mm.

Adult in the National Museum from Kusaie.

Red Sea, East Africa, East Indies, China, Pelew Island, Carolines.

Syngnathus djarong Bleeker.

Syngnathus djarong Bleeker: Batav. Genoot., Verh. (Trosk.), vol. 25, p. 22, 1853 (type loc., Panimbang, western Java).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 4, p. 79, 1922 (Waigiu and New Guinea).—Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 41, p. 17, pl. 2, fig. 5, 1925 (Rein Bay and Zoller Bay, New Pommerania; Langemak Bay, Hansa Bay and Kelana Harbor, New Guinea).

Differs from *Syngnathus spicifer* in trunk ventrally paler than back or reticulated with brown (in *S. spicifer* with 13 to 15 white crossbars).

Ceylon, East Indies, Philippines, New South Wales.

Syngnathus modestus Günther.

Syngnathus modestus Günther: Cat. fishes Brit. Mus., vol. 8, p. 166, 1870 (type loc., New Hebrides?; South America?).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 429, 1910 (Aneiteum).

D. 22, begins on last body ring; rings 17 + 31; opercle with faint keel. Length 150 mm.

New Hebrides.

Syngnathus tristriatus (Fowler) (fig. 24).

Leptonotus tristriatus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 444, fig. 1, 1921 (type loc., Fiji).

Rings 21 + 40?; D. 42, on 3 + 8 rings; upper keel discontinuous; median dark predorsal band to snout and another each side of head through eye. Length about 136 mm.

Type in the Academy examined. There is a short anterior horizontal keel on the opercle.

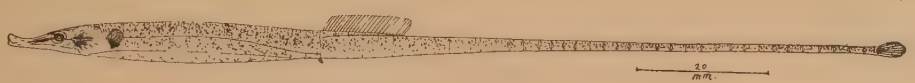

FIGURE 23.—Drawing of *Syngnathus spicifer*.

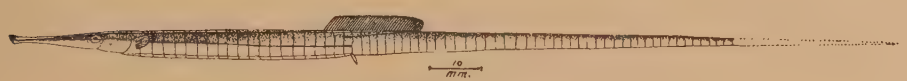

FIGURE 24.—Drawing of *Syngnathus tristriatus*.

Originally I wrongly placed this species in *Leptonotus*.

Corythoichthys flavofasciatus (Rüppell).

Syngnathus flavofasciatus Rüppell: Neue Wirbleth. Fisch., p. 144, 1835 (type loc., Djedda, Red Sea).

Corythoichthys flavofasciatus Fowler: B. P. Bishop Mus., Bull. 22, p. 7, 1925 (Guam).

Corythoichthys fasciatus (non Risso 1810) Kaup: Cat. Lophobr. fishes, p. 25, 1856 (Nukuhiva, Marquesas Islands).—Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 281, 1868 (Dorey, New Guinea).—Duncker: Mus. Hamburg, Mitt., vol. 32, p. 72, 1914 (1915) (Indo-Pacific).—Duncker and Mohr: op. cit., vol. 41, p. 16, 1925 (Kewieng, Nusa, New Mecklenburg; Rein Bay and Blanche Bay on Vulcan Island, New Pommerania; Friedrich Wilhelm Harbor, New Guinea).

Corithoichthys fasciatus Kner: Reise "Novara," Fisch., vol. 1, pt. 5, p. 391, 1865 (Tahiti).

Syngnathus fasciatus Duméril: Hist. nat. Poiss., vol. 2, p. 543, 1870 (Nukuhiva).

Syngnathus conspicillatus (non Jenyns) Günther: Cat. fishes Brit. Mus., vol. 8, p. 174, 1870 (Fiji; Aneiteum).

Ichthyocampus papuensis Sauvage: Soc. Philom. Paris, Bull., 7th ser., vol. 4, p. 228, 1879 (type loc., Dorey, New Guinea).

Corythroichthys waitei Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 212, fig. 17, 1905 (1906) (type loc., Samoa).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 17, 1906 (Faté, New Hebrides).

Syngnathus haematopterus Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 431, pl. 167, fig. C, 1910 (Fiji; Santa Anna Island).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 102, 1913 (Saonek, Waigiu).

Two in the Bishop Museum from Faté, New Hebrides, 125 mm. and 147 mm. long. In the National Museum 7 from Samoa, 72 to 98 mm., obtained by the Wilkes Expedition.

Red Sea, Zanzibar, India, East Indies, Japan, Australia, Tahiti.

Corythoichthys conspicillatus (Jenyns).

Syngnathus conspicillatus Jenyns: Voyage "Beagle," Fish, p. 147, pl. 27, fig. 4, 1842 (type loc., Tahiti).—Garman: Mus. Comp. Zool., Bull., vol. 39, p. 239, pl. 5, fig. 2, 1903 (three miles south of Suva lightship).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 430, pl. 167, fig. b, 1910 (Paumotu; Micronesia; Society Islands; Samoa).

Corythoichthys conspicillatus Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 264, 1911 (Jaluit, Marshalls).—Duncker: Mus. Hamburg, Mitt., vol. 32, p. 73, 1914 (1915) (Pacific Ocean?).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 442, 1921 (Tahiti).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 10, 1925 (Wake Island).—Fowler and Bean: United States Nat. Mus., Proc., vol. 71, p. 14, 1927 (Tahiti).

Corythroichthys sealei (Jordan and Starks) Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 213, fig. 18, 1905 (1906) (type loc., Apia, Samoa).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 17, 1906 (Faté, New Hebrides).

Head 3 3/5 to 3 2/3 to vent; depth 2 1/3 to 2 1/2 in head; D. 27 or 28; A. 3; P. 16; snout 1 3/4 to 1 4/5 in head measured from upper jaw tip; eye 4 4/5 to 5; maxillary 2 to 2 1/4 in eye; interorbital 1 1/3 to 1 1/2; rings 16 + 34 or 35.

Body long, robust, deep as wide; upper lateral keel of trunk not continuous with that of caudal and not extended quite to end of dorsal fin; upper caudal keel begins nearly opposite dorsal origin; median lateral keel of trunk ends opposite dorsal origin, not continuous with lower caudal keel; lower keel of trunk continuous with that of tail; trunk with slight median ventral keel to vent. Head width 2 4/5 to 3 1/5 in its total length. Snout well compressed, width at front of eyes 3 3/4 to 4 in its length. Eye with front edge at last 2/5 in total head length, greater than interorbital. Mouth small, superiorly terminal. No teeth. Interorbital concave. Strong postocular keel each side above and strong median occipital keel. Opercle with strong horizontal ridge, otherwise rugose. Slight median rostral keel from interorbital forward 2/3 of snout. Keels on body all strongly developed, entire, each ending in slight spine behind. Rings each with fine parallel vertical striae. Dorsal on 1 trunk and 6 caudal rings, height 2 2/3 to 2 4/5 in head; caudal 2 1/2 to 2 3/5; pectoral 4 1/3 to 5.

Pale brownish generally, with gray-white about edges. Black line along each side of head below eye. Black blotch behind eye and another on hind end of opercle. Snout with small dusky to blackish spots above. Iris white, with black horizontal line medianly. Sometimes black superciliary blotch in interorbital. Side with 14 transverse blackish-brown blotches, first 9 of which as pairs. These dark bars also reflected across back and tail above. Fins pale, immaculate. Chest or ventral surface of first 13 rings with as many pairs of black blotches. Under surface of trunk and tail otherwise uniform. Length 140 to 155 mm.

In the Agassiz Museum 12 from Ascension Island, Marshall Islands, through Rev. A. A. Strong, April 14, 1877, and 6 from the Society Islands. In the Bishop Museum 1, 195 mm. long, from Faté, also 3 from Wake Island in 1923. In the Academy 12 from Tahiti.

Weber and Beaufort state that the distinction between this species and *Corythoichthys flavofasciatus* (Rüppell) is its more slender snout, conspicuously less than half the head.

Imperfectly noticed by Jouan as *Syngnathus* (Soc. Cherbourg, Mem., vol. 8, p. 250, 1861). His specimen 120 mm. and snout, dorsal and caudal rosy. Port de France, New Caladonia.

Micrognathus brevirostris (Rüppell).

Syngnathus brevirostris Rüppell: Neue Wirbelth. Fisch., p. 144, 1835 (type loc., Massaua, Red Sea).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 102, 1913 (Saonek, Waigiu).

Micrognathus brevirostris Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 4, p. 75, 1922 (Waigiu and New Guinea).

Syngnathus tetrophthalmus Weber: Zool. Forsch. Australien (Semon), vol. 5, p. (115) 275, 1895 (coast of New Guinea).

Snout without median crest; equal or somewhat shorter than postorbital.

East Africa to the East Indies.

Micrognathus mataafae (Jordan and Seale).

Corythroichthys mataafae Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 213, fig. 19, 1905 (1906) (type loc., off Mulinu ú, Samoa).

Corythoichthys mataafae Fowler: B. P. Bishop Mus., Bull. 22, p. 7, 1925 (Guam).

Snout with crest of 4 to 6 strong teeth; much shorter than postorbital.

In the National Museum 1 obtained at Tongatabu by the Wilkes Expedition.

Samoa, East Indies.

Micrognathus balli (Fowler) (fig. 25).

Corythoichthys balli Fowler: B. P. Bishop Mus., Bull. 22, p. 24, 1925 (type loc., Waikiki reef, Honolulu).

Corythoichthys mataafae (non Jordan and Seale) Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 375, 1923 (Waikiki, Oahu).

FIGURE 25.—Drawing of *Micrognathus balli*.

Head 3 1/3 to vent; 8 1/4 in total; depth 7; D. 21; snout 2 2/5 in head; eye 6 1/4; interorbital 1 1/2 in eye; head width 2 2/5 its length; rings 15 + 33. Traces of 3 dark supero-lateral blotches before dorsal, 5 in median line on back, with first on occiput and last at dorsal origin. Length 50 to 58 mm.

C. H. Edmondson obtained 1 at Waikiki in August 1922 and another October 15 of the same year.

Halicampus koilomatodon (Bleeker).

Syngnathus koilomatodon Bleeker: Soc. Sci. Ind. Neerl., Act. (Jap.), vol. 5, p. 10, pl. 1, fig. 1, 1858-59 (type loc., Nagasaki).

Halicampus koilomatodon Duncker: Mus. Hamburg, Mitt., vol. 32, p. 111, 1914 (1915) (southern New Guinea).

Rings 17 or 18 + 33 to 36; D. 19 to 22, on 2 or 3 + 1 to 3 rings. Length 152 mm.

Ceylon, East Indies, Philippines, North West Australia, Japan.

The reference to *Ichthyocampus maculatus* Jouan (Soc. Cherbourg, Mem., vol. 21, p. 332, 1877-78) is based on his account (op. cit., vol. 9, p. 178, 1863, from New Caledonia). This account is a very imperfect description, which may really refer to *Yozia bicoarctata* (Bleeker). Condensed it is as follows:

Body with 6 ridges, upper and lower horizontal to vent, which at 2/3 in total length. Tail little robust, with 4 ridges. Edges of ridges well marked, following ring denticulate, producing somewhat spiny appearance. At thickest portion 20 rings, shield like, their design inconspicuous. Head bony, without pronounced spines. Dorsal somewhat developed, begins above vent and length 1/7 of total fish. Anal little evident. Caudal well marked, small, rounded. Pectoral moderate, length nearly equals body height at base of fin. Length 210 mm.

HIPPOCAMPINAE

Brood organ subcaudal permanent egg pouch, permanently closed by median coalescense of lateral cutaneous folds and furnished with cranial opening, which can be closed by circular muscle.

Hippocampus histrix Kaup.

Hippocampus histrix Kaup: Cat. Lophobr. fish, p. 17, pl. 2, fig. 5, 1856 (type loc., Japan).

Hippocampus hystrix Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 436, pl. 167, fig. D, 1910 (Tongatabu; New Pommerania; Society Islands).

Head 1 1/3 in trunk; depth 4 2/5; D. 17; A. 4; P. 18; snout 2 in head; eye 7; maxillary 9; interorbital 12 1/4; rings 12 + 32.

Body well compressed, trunk deepest midway in its length. Rings all with long and rather slender pointed spines, longest equal eye. Head compressed, width 1/4 its length. Snout long, compressed, upper and lower edges parallel. Eye 3 3/4 in snout. Mouth very small. Maxillary small, obliquely vertical, 3/4 of eye. No teeth. Mouth small, close before eye. Interorbital deeply concave. Supraorbital spine strong, 4/5 of eye; single frontal spine, little inclined upward from horizontal; moderate postocular spine flares outward; 3 strong opercular spines; coronet with cluster of 4 strong spines, preceded by strong vertical one; 2 strong median nuchal spines; tail with row of strong supero-lateral spines, only few short infero-lateral spines anteriorly.

Brown with crowded fine pale dots, more or less whitish, variable. Snout and under surface of head with several whitish streaks or blotches. Dorsal rays whitish, each with 2 neutral-grayish blotches. Pectoral uniform pale brownish. Length 145 mm.

In the Agassiz Museum 1 from Tahiti. Also a Hawaiian specimen about 85 mm. long, in poor preservation, obtained by C. F. Winslow at Maui. This is interesting as an addition to the Hawaiian ichthyfauna. As it is young it is much less spinescent.

Red Sea, Zanzibar, East Indies, Japan, Tahiti.

Hippocampus kuda Bleeker (Pl. VIII, *A*).

Hippocampus kuda Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 82, 1852 (type loc., Singapore).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 28, 1869 (Samoa).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 4, p. 110, 1922 (New Guinea).—Fowler: B. P. Bishop Mus., Bull. 22, p. 25, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 10, 1925 (Necker Island).—Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 41, p. 18, 1925 (Kewieng Nusa, New Mecklenburg; Linden Harbor, New Pommerania; Friedrich Wilhelm Harbor and Dörperspitze, New Guinea).—Fowler: B. P. Bishop Mus., Bull. 38, p. 8, 1927 (Honolulu).

Hippocampus guttulatus var. *kuda* Schmeltz: Mus. Godeffroy, Cat. 5, p. 39, 1874 (Samoa).

Syngnathus hippocampus (non Linné) Lichtenstein: Descriptiones animalium, Forster, p. 257, 1844 (Tanna).

Hippocampus novae-hollandiae (non Steindachner?) Schmeltz: Mus. Godeffroy, Cat. 4, p. 28, 1869 (Viti Levu).—Schmeltz: op. cit., 5, p. 38, 1874 (Viti Levu).—Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 354, 1876 (New Guinea).

Hippocampus guttulatus Schmeltz: Mus. Godeffroy, Cat. 5, p. 39, 1874 (Tonga).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 279, 1883 (southeast coast New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 435, 1910 (Samoa; Tonga; Society Islands; Ponapé; New Pommerania).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 264, 1911 (Suva, Fiji).—Pietschmann: Nassau. Ver. Naturk., Jahrb., pt. 66, p. 197, 1913 (Friedrich-Wilhelm's Harbor, Kaiser Wilhelm's Land, New Guinea).

Hippocampus fisheri Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 169, 1902 (1903) (type loc., Kailua and Hilo).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 119, fig. 36, 1903 (1905) (type).

Hippocampus hilonis Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 169, 1902 (1903) (type loc., Hilo).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 119, pl. 23, 1903 (1905) (type).

One from Pearl Harbor, Oahu, in 1905, and 2 from Honolulu in 1916, obtained by J. W. Thompson, in the Bishop Museum. Also 3 taken from the stomach of an aku (*Caranx*) May 19, 1917 and brought to Honolulu. One presented by the Bureau of Fisheries, from Honolulu in 1901. Two from Necker Island in 1923. In the National Museum 1 from Suva. Also the types of *Hippocampus fisheri* and *Hippocampus hilonis*. In the Agassiz Museum one 230 mm. from Hawaii, from W. H. Jones. Also 1 from Maui from C. F. Winslow.

The alleged character given for *Hippocampus hilonis* by Jordan and Evermann as "a short keel in front of the coronet" applies to my large male specimen, while in the female and young it is not developed. Both my adults show traces of a dark submarginal band on the dorsal and they also have shorter snouts than given for *Hippocampus hilonis*. The dorsal fin rays vary 16 to 18. The species *H. hilonis* differs from *H. histrix* in that the tubercles are not spiny.

Jouan notices a *Hippocampus* (Soc. Cherbourg, Mem., vol. 8, p. 250, 1861) 120 mm. long, from Port de France, New Caledonia. D. 18 or 20. Rings 11+31.

Indo-Pacific, Japan, Hawaii.

PEGASIDAE

Pegasus draconis Linné.

Pegasus draconis Linné: Systema nat., 12th ed., p. 418, 1766 (type loc., India).—Peters: Akad. Wiss Berlin, Monatsb., p. 839, 1876 (1877) (New Britain).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 428, 1910 (New Pommerania).

Tail of 8 rings. Finely reticulated with brown; snout and last 2 or 3 caudal rings black; pectoral rays with fine brown dots; pectoral fin with broad milky-white edge, within which another concentrical band of whitish; length 100 mm. (Günther)

Indian Ocean, East Indies, Melanesia.

Pegasus papilio Gilbert.

Pegasus papilio Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 614, fig. 239, 1903 (1905) (type loc., near Bird Island and off northeast coast of island of Hawaii, 24 to 83 fathoms).

Head 3 1/8; depth 1 2/3 in head; D. 5; A. 5; P. 11; V. 2; head width at processes opposite gill opening 1 1/3 in head length; greatest head depth 2 1/5; snout 2; eye 4; interorbital 3; first dorsal ray 1 3/4; second anal ray 1 7/8; caudal 1 1/2; greatest body depth, opposite ventral bases, 1 3/4.

Body well depressed, widest at pectoral bases; lateral ridge and one each side of median line well developed; last extending as lateral ridge on each side of constricted portion of trunk behind vent, forming 8 rings, edges of each more spine-like progressing posteriorly until at last 2 rings each margin of keel with short spine projecting forward and another backward; lateral dorsal ridge followed by 4 lateral keels each side of body and each ends in backwardly directed spine; row of lower lateral spines from lateral keels similar to upper laterals; at caudal base single dorsal and ventral space at fin origin.

Head as viewed above triangularly elongate. Snout elevated forward, spatulate, depressed, with row of spines each side and supero-lateral row of smaller spines, all close set, simple and antero-median of lower lateral row largest. Eye large, 2 in snout, with broad bony orbital case. Mouth very small, inferior, last fifth in snout. Interorbital deeply concave. Low median and lateral tubercle each side of occiput; close behind occiput pair of close-set concavities; back with 3 longitudinal rows of as many depressions, intersections tubercular. On front face of extension of pectoral base fan of 6 spines flaring toward head.

Dorsal begins on second ring of abdomen, depressed fin reaching penultimate. Anal inserted on same ring, opposite dorsal, though not quite reaching far back as dorsal. Caudal elongate, rounded behind or with median rays longest. Pectoral broad, length 2 1/3 in combined head and trunk, rays graduated to postero-median, outer membranes incised, with incision gradually shorter backwards. Ventral 3 1/3 in combined head and trunk.

Pale brown generally on upper surface, sprinkled with small scattered white spots, which also extend over dorsal surface of pectorals. Latter with black median transverse band and another terminally. Sutures of first 3 and last 2 abdominal rings dusky. Caudal pale, with several faint brown transverse bars and blackish one terminal, another subterminal. Ventral surface whitish, though dusky sutures of last 2 rings continued across.

One caught off Kakaako, Oahu, October 18, 1921, by M. Yamamoto. Now in the Bishop Museum. Length 70 mm.

This species differs from *P. draconis* in the different coloration, especially the dark transverse bar on each pectoral, besides the white dotted coloration of the back and upper surface generally. It shares in common, however, a dark rostrum and the last caudal rings dark.

Parapegasus volitans (Linné).

Pegasus volitans Linné: Systema nat., 10th ed., p. 338, 1758 (type loc., Amboina).—Whitley: Australian Mus., Records, vol. 15, no. 5, p. 295, 1927 (Wilanti, south Malaita, Solomons).

Differs from *Parapegasus natans* in back of trunk with 2 median ridges, each with 3 compressed and more or less trenchant longitudinal tubercles.

East Indies, China, New South Wales, Melanesia, Japan.

Parapegasus natans (Linné) (Pl. VIII, *B*).

Pegasus natans Linné: Systema nat., 12th ed., p. 418, 1766 (type loc., India).—Günther: Cat. fishes Brit. Mus., vol. 8, p. 148, 1870 (New Guinea).—Weber: Zool. Forsch. Australien (Semon), vol. 5, p. (108) 268, 1895 (coast of New Guinea).

Differs from the other species in the longer body, the tail of 12 rings. Upper surface and both surfaces of pectorals, finely dotted with brown. Length 182 mm.

East Indies, China, Northern Australia.

AULOSTOMIDAE

Aulostomus chinensis (Linné).

Fistularia chinensis Linné: Systema nat., 12th ed., p. 515, 1766 (type loc., eastern India).

Aulostoma chinense Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 31, 1874 (Samoa; Tahiti).—Schmeltz: op. cit., Cat. 6, p. 16, 1877 (Tahiti).—Streets: U. S. Nat. Mus., Bull., vol. 7, p. 74, 1877 (Honolulu).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 15, pt. 7, p. 221, pl. 123, figs. b-c, 1881 (Hawaiian islands; Society Islands; Paumotus; Aneiteum).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 502, 1901 (Honolulu; Laysan).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 18, 21, 1902 (Honolulu).

Aulostomus chinensis Smith and Swain: U. S. Nat. Mus., Proc., vol. 5, p. 121, 1882 (Johnston Island).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 500, 1900 (Oahu).—Fowler: op. cit., p. 439, 1921 (Honolulu; Hawaiian islands; Oahu; Pacific Ocean).—Fowler: Copeia, no. 112, p. 82, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 7, 1925 (Guam).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 10, 1925 (French Frigates Shoal, Lisiansky, Wake, and Laysan islands).

Aulostomus valentini Jordan and Starks: U. S. Nat. Mus., Proc., vol. 26, p. 64, 1903 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 437, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 523, 1902 (1904) (Honolulu; Laysan).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 942, 1904 (Honolulu; Laysan).—Jordan and Seale: (U. S.) Bur. Fisher., Bull., vol. 25, p. 211, 1905 (1906) (Apia).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 17, 1906 (Tahiti).

Aulostoma valentini Steindachner: Akad. Wiss. Wien, Sitzs., vol. 115, pt. 1, p. 148, 1906 (Upolu).

Head 2 7/8 to 3; depth 10 2/3 to 18; D. X to XII-1v, 23, 1 or 24, 1; A. 1v, 25, 1 or 26, 1; snout 1 2/5 to 1 1/2 in head from upper jaw tip; maxillary 5 1/8 to 7 2/3; mandible 3 2/3 to 5 1/2 in total head length; eye 5 3/5 to 9 in snout, 2 1/6 to 4 in postorbital; interorbital 7 to 9 1/2 in snout. Scales with 3 basal radiating striae; apical denticles 27.

Coloration very variable. Frequently 2 black caudal spots, often 1, or sometimes absent. Sometimes black basal ventral spots or spot on maxillary absent. Usually black at bases of dorsal and anal, though this often absent. Young with crossbands or blotches.

In the Bishop Museum 23 from Honolulu and 1 from Tahiti 165 mm. Also 1 from Maui and 2 from off Waialae, Honolulu, January 5, 1922, by J. M. Westgate. Two from French Frigates Shoal, 1 Lisiansky, 1 Wake Island, all in 1923. I examined 9 specimens in the Honolulu markets during December 1922. Largest 748 mm. In the National Museum 1 obtained at Oahu by the Wilkes Expedition. Others are 6 from Honolulu, 1 from Laysan from Max Schlemmer, 1 from Johnston Island and 1 from Samoa. In the Agassiz Museum 9 from the Society Islands and 2 from Ebon Island. In the Academy 1 labeled Pacific Ocean from J. K. Townsend, doubtless Honolulu, 1 from Oahu received from W. H. Jones and 3 others from Honolulu.

Widely distributed through the Indo-Pacific.

FISTULARIIDAE

Fistularia petimba Lacépède.

Fistularia petimba Lacépède: Hist. nat. Poiss., vol. 5, pp. 349, 350 (pl. 18, fig. 3 in vol. 2), 1803 (type loc., New Britain; Reunion; Antilles).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 437, 1902 (1903) (Honolulu; Tahiti).—Snyder: op. cit., vol. 22, p. 523, 1902 (1904) (Honolulu; Hilo; Hanalei Bay, Kauai; Necker Island).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 116, 1903 (1905) (Honolulu; Hilo; Kailua; Samoa; Tahiti).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, 1906 (Mangareva; Faté, New Hebrides; Shortland Island, Solomons; Raiatea, Society Islands; Rarotonga, Cook Islands; Nukuhiva, Marquesas; Makatea, Paumotus).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1419, 1906 (Savaii).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 211, 1905 (1906) (Samoa).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 425, 1907 (Fiji).—Kendall and Goldsborough: Mus. Comp. Zool., Mem. 26, p. 263, 1911 (Papeete, Tahiti; Arhno Atoll, Marshalls; Moen, Truk Group, Carolines; Vavau, Tonga Islands; Suva, Fiji; Makemo and Fakarava, Paumotus).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 439, 1921 (Hawaiian islands).—Fowler: Copeia, no. 122, p. 82, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 7, 24, 1925 (Guam; Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 10, 1925 (French Frigates Shoal and Johnston Island).

Fistularia tabaccaria (non Linné) Lichtenstein: Descriptiones animalium, Forster, p. 155, 1844 (tropical Pacific).

Fistularia commersonii Thiollière: Fauna Woodlark, p. 202, 1857 (Woodlark Island).

Fistularia aribar (Montrouzier) Thiollière: op. cit., p. 202, 1857 (name in synonymy).

Fistularia serrata (non Cuvier?) Schmeltz: Mus. Godeffroy, Cat. 4, p. 21, 1869 (Samoa).—Streets: U. S. Nat. Mus., Bull., vol. 7, p. 74, 1877 (Honolulu).—Peters: Akad. Wiss. Berlin, Monatsb., p. 842, 1876 (1877) (Dana Island, New Britain and New Ireland).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 270, 1883 (Hood Bay, New Guinea).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 437, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 116, 1903 (1905) (Jenkins material).

Fistularia seraata Vaillant: Soc. Philom. Paris, Bull., 7th ser., vol. 11, p. 55, 1886-87 (Rangiroa, Tuamotus).

Solenostomus serratus Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

Fistularia depressa Günther: Rept. voyage "Challenger," vol. 1, p. 69, pl. 3, fig. D, 1880 (type loc., Natal, Zanzibar, Amboina, China, New Guinea, New South Wales, Fiji, California).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 221, 1881 (New Guinea, Fiji, Samoa, Ponapé).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 64, 1900 (1901) (Guam).—Seale: op. cit., vol. 1, no. 5, pp. 15, 19, 1902 (Hilo, Honolulu).—Waite: Australian Mus., Records, vol. 5, p. 3, 1903 (Nauru, Pleasant Island, Marshalls).—Beaufort: Bijd. Dierk., Amsterdam, vol. 19, p. 101, 1913 (Saonek, Waigiu).

Head 2 3/5 to 3 1/10; depth 31 to 33; D. 15 to 17; A. 14 to 16; snout 1 1/3 to 1 2/5 in head from upper jaw tip; eye 7 3/5 to 10 1/3 in snout; maxillary 6 1/5 to 8 1/8; interorbital 9 2/3 to 10 1/2, bony portion 2 1/8 to 2 1/2 its entire width; eye 2 2/3 to 2 3/4 in postocular. Skin smooth and without median predorsal row of short keels. Caudal filament mostly longer in smaller examples. Brown in alcohol, without markings, pale or whitish below.

The Bishop Museum has 10 from Honolulu, largest 1191 mm. long without caudal filament and in 1 head 375 mm. long. Others, 1 French Frigates Shoal, 1 Johnston Island, 1 Hilo, 4 Guam, 2 Nukuhiva, 7 Rarotonga, 1 Faté, 1 Mangareva, 1 Raiatea, 1 Makatea. An interesting specimen obtained by C. H. Edmondson at Waikiki, Oahu, on November 22, 1922, has 5 slender caudal filaments, of which median largest. In the Honolulu markets I examined over 500 in November and December, 1922, but did not meet with a single specimen of *Fistularia villosa*. In the National Museum 1 from Oahu and 1 from the Tuamotus, both obtained by the Wilkes Expedition. Other materials are 5 Hawaiian, 20 from Papeete, 2 from Arno Atoll and 1 each from Makemo, Vavau, Fakarava and Suva. Also a half-grown specimen from Hawaii, obtained by T. H. Streets. In the Agassiz Museum 1 from Honolulu through W. H. Jones in 1874, 6 Hawaiian from Andrew Garrett, 1 from the Weather Coast of Kauai, 1 from Ponapé and 2 from Kingsmills. The Academy has 5 Hawaiian specimens and 1 from Fiji, the Fijian specimen a dried specimen.

I have placed all the references in Oceania under *Fistularis petimba* as most writers fail to clearly distinguish *Fistularia villosa* Klunzinger, as set forth by Weber and Beaufort. It may readily be known by its finely roughened skin and a row of median keels down the back, both before and behind the dorsal fin. *Fistularia villosa* is usually captured in deep water. *Fistularia corneta* Gilbert and Starks (Cal. Acad. Sci., Mem., vol. 4, p. 56, pl. 10, figs. 18-18a, 1904, Panama and Mazatlan) appears only slightly different from *Fistularia petimba* in the smaller eye and broader interorbital.

Jouan describes a specimen 350 mm. long as *Fistularia* (Soc. Sci. Nat. Cherbourg, Mem., vol. 8, p. 301, 1861), from Port de France,

New Caledonia. It is evidently intended for this species, with the color given as brownish on the back and bluish below.

Fistularia villosa Klunzinger.

Fistularia villosa Klunzinger: Zool. bot. Ges. Wien, Verh., vol. 21, p. 516, 1871 (type loc., Red Sea).—Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 41, p. 4, 1925 (Hawaiian islands; Jaluit; Apia; Pelew Islands; south coast, Linden Harbor, Stettin and Rein Bays, New Pommerania; Friedrich Wilhelm and Dörperspitz, New Guinea).

Widely distributed in the Indo-Pacific from the Red Sea to Natal and the East Indies through Melanesia, Micronesia, Polynesia and Hawaii.

CENTRISCIDAE

Centriscus strigatus (Günther).

Amphisile strigata Günther: Cat. fishes Brit. Mus., vol. 3, p. 528, 1861 (type loc., Java).—Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 298, 1868 (Waigiu).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 21, 1869 (Pelew Islands).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 222, pl. 125, G, 1881 (Pelew Islands).—Macleay: Linn. Soc. New South Wales, Proc., 8, p. 271, 1883 (southeast New Guinea).—Ogilby: Australian Mus., Records, vol. 1, no. 7, p. 7, 1890-91 (Howla Island, Solomons).—Whitley: Australian Mus., Records, vol. 15, no. 5, p. 292, 1927 (Vila Harbor, New Hebrides).

Aeoliscus strigatus Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 101, 1913 (Beo, Waigiu).

Centriscus strigatus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 375, 1923 (Honolulu).—Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 41, p. 6, figs. 1 to 3, 1925 (north coast New Mecklenburg and Lukus, Admiralty Islands; south coast, New Pommerania; Friedrich Wilhelm Harbor and Dörperspitze, New Guinea; Pelew Islands).

Amphisile komis Macleay: Linn. Soc. New South Wales, Proc., vol. 3, p. 166, pl. 19 b, 1879 (type loc., Komis, Maleggiok on Bahelstaub Island, Pelew Group).

Four in the Bishop Museum, obtained at Honolulu in 1909, these 80 to 93 mm. Also 9 from Fatè, New Hebrides, obtained by Alvin Seale in 1902, these 121 to 125 mm. The blackish lateral band is very distinct in all. In the Agassiz Museum 16 specimens from Ascension Island, Marshall Islands, from the Rev. A. A. Strong. Also 14 from the Pelew Islands, obtained by R. Lowey.

Macleay's figure shows his *Amphisile komis* to be this species. The dorsal spine, with a movable tip is hardly a generic character, so *Acoliscus* is here used subgenerically.

Persian Gulf to East Indies, Japan, Solomon Islands and Hawaii.

Centriscus scutatus Linné.

Centriscus scutatus Linné: Systema nat., 10th ed., p. 336, 1758 (type loc., eastern India).—Bleeker: Akad Amsterdam, Verslagen, 2nd ser., vol, 2, p. 98, 1868 (Waigiu).

Amphisile scutatum Jouan: Soc. Cherbourg, Mem., vol. 9, p. 183, 1863 (on Jouan, 8, p. 250, 1861) (Kanala, New Caledonia).

Amphisile finschii Hilgendorf: Naturforsch. Freund Berlin, Sitz., p. 52, 1884 (type loc., New Britain).

Centriscus finschii Weber: Nederlandisch Tijds., Dierk., vol. 11, pt. 2, p. 74, 1909 (note).

Postorbital part of head half or more than half distance of opercle from pectoral base. Interorbital with groove continued to crown of head. Sutures of lateral plates serrated. Length 150 mm. (Weber and Beaufort)

Red Sea, Madagascar, Ceylon to East Indies, New Caledonia, and New Britain.

MACRORHAMPHOSIDAE

Macrorhamphosus velitaris (Pallas).

Centriscus velitarus Pallas: Spicileg. Zool., fasc. 7, p. 36, pl. 4, fig. 8, 1770 (type loc., Amboina).

Centriscus brevispinis Kner and Steindachner: Akad. Wiss. Wien, Sitz., vol. 54, pt. 1, p. 374, fig. 9, 1866 (type loc., Samoa).

Centriscus gracilis (non Lowe) Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 222, 1881 (Samoa).—Weber: Nederlandsch Tijds. Dierk., vol. 11, pt. 2, p. 72, 1909 (note).

Macrorhamphosus hawaiiensis Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 613, fig. 237, 1903 (1905) (type loc., near Laysan Island, 59 to 70 fathoms).

Eye somewhat less than postorbital.

Indo-Pacific, from East Africa, Mediterranean, to China, Samoa, and Hawaii.

The following fishes have all been reported from Oceania, through doubtless introductions. They belong to the order Labyrinthici, of the Indian region.

Ophicephalus punctatus Bloch.

Ophicephalus punctatus Bloch: Nat. ausländischen Fische., pt. 7, p. 139, pl. 358, 1793 (type loc., Malabar Coast).

Ophiocephalus punctatus Kner: Reise "Novara," Fische, vol. 1, pt. 5, p. 233, 1865 (Tahiti).

Ophicephalus striatus Bloch.

Ophicephalus striatus Bloch: Nat. ausländischen Fische, pt. 7, p. 141, pl. 359, 1793 (type loc., Malabar).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 533, 1903 (1905) (Honolulu).

Anabas testudineus (Bloch).

Anthias testudineus Bloch: Nat. ausländischen Fische, pt. 6, p. 121, pl. 322, 1792 (type loc., Japan).

Anabas scandens Kner: Reise "Novara," Fische, vol. 1, pt. 5, p. 217, 1865 (Tahiti).

ATHERINIDAE
ATHERININAE

Body slender, often not well compressed, belly rather long. Premaxillary usually slender. Dorsals widely separated, first much less than interspaces. Tropical and temperate zones, but few in fresh-water.

Atherina temminckii Bleeker.

Atherina temminckii Bleeker: Nat. Tijds. Ned. Ind., vol. 5, p. 506, 1853 (type loc., Priaman, Sumatra; Batavia, Java).

Atherina brachyptera Schmeltz: Mus. Godeffroy, Cat. 4, p. 20, 1869 (Samoa and Viti Islands).

Atherina uisila Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 216, fig. 23, 1905 (1906) (type loc., Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., 26, p. 255, 1911 (Wotje Atoll, Marshalls).

Atherina endrachtensis (non Quoy and Gaimard) Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 254 (Arhno Atoll, Moen, Suva, Rangiroa, Paumotus).

Head 3 2/5 to 3 3/4; depth 5 1/3 to 5 1/2; D. V-I,

9, 1; A. 1, 10; scales (pockets) 40 to 43 in median lateral series to caudal base and 2 more on latter; 7 scales transversely, 18? predorsal; snout 3 7/8 to 4 in head measured from upper jaw tip; eye 2 3/5 to 3; maxillary 2 2/5 to 2 3/5; interorbital 3 1/8 to 3 1/3.

Body fusiform, rather slender, compressed. Caudal peduncle compressed, least depth 2 1/2 in its length or 3 1/2 to 3 3/4 in total head length.

Head width 2 1/3 to 2 2/3 in its length. Snout obtuse, length 7/8 its width. Eye large, impinging on upper profile, hind pupil edge midway in head length. Mouth moderate, mandible protruded. Maxillary slender, largely concealed, extends slightly beyond front of eye. Teeth minute, in narrow bands in jaws and on vomer, none on palatines. Rami of mandible well elevated inside mouth. Interorbital slightly depressed. Gill rakers 5+15, lanceolate, slender, 1 3/4 in eye; gill filaments about 3/4 of gill rakers. Scales with 1 to 4 basal knobs and 7 to 11 basal rows of vertical striae. First dorsal spine 2 1/4 to 2 1/3 in head; first dorsal ray 2 1/4 to 2 1/3; first anal ray 2 1/4 to 2 2/5; caudal 1 1/3 to 1 3/4, emarginate; pectoral 1 2/3 to 1 4/5; ventral 2 1/5 to 2 1/3.

Body pale brownish, scales on back with finely dusky edges. Side with silvery-white band, wide as pupil. Fins pale brownish. Length 36 mm.

In the Agassiz Museum 8 from Truck Island, Caroline Islands, obtained by the *Albatross,* largest 44 mm. The National Museum has 1 from Wotje, 27 from Suva, 5 from Rangiroa, 6 from Moen, 3 from Arhno, 1 from Ratak Chain and 1 from Guam.

Weber and Beaufort note of the materials listed above and reported by Kendall and Goldsborough, "of some of them a few characteristics are notified; these specimens certainly do not belong to *endrachtensis* Quoy and Gaimard but possibly to *Atherina temminckii* Bleeker. But the descriptions are too incomplete to settle this question."

East Indies, Philippines, Tuamotus.

Atherina endrachtensis Quoy and Gaimard.

Atherina endrachtensis Quoy and Gaimard: Voyage "Uranie," Zool., p. 334, 1825 (type loc., China Sea; Terre d'Endracht).—Valenciennes: Hist. nat. Poiss., vol. 10, p. 338, 1835 (New Guinea).

Atherina eendrachtensis Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 106, 1913 (Majalibit Bay, Waigiu).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 4, p. 270, 1922 (type, Waigiu).—Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 135, 1926 (Seeadler Harbor, Admiralty Islands).

In this and the following species of the genus the vent is conspicuously before the first dorsal. Also pectorals smaller, 5 times or less in total length.

In the National Museum 2 from New Guinea.

East Indies.

Atherina forskalii Rüppell.

Atherina forskalii Rüppell: Neue Wirbelth., Fisch., p. 132, pl. 33, fig. 1, 1835 (type loc., Red Sea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 362, 1882 (New Guinea).

Atherina forskali Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 4, p. 274, 1922 (Waigiu).—Duncker and Mohr: op. cit., vol. 42, p. 135, 1926 (Thilenius and Simpson harbors, New Pommerania).

Vertical through vent and vertical through first dorsal origin separated by 3 or 4 scales; lateral scales 42 to 45; first dorsal origin opposite 15th or 16th lateral scale, of second dorsal opposite 25th or 26th scale; vent opposite 12th to 14th scale. Length 130 mm. (Weber and Beaufort)

Red Sea, Zanzibar, East Indies.

Atherina duodecimalis Valenciennes.

Atherina duodecimalis Valenciennes: Hist. nat. Poiss., vol. 10, p. 339, 1835 (type loc., Ceylon).—Bleeker: Soc. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 105, 1913 (Majalibit Bay, Waigiu).—Duncker and Mohr: op. cit., vol. 42, p. 135, 1926 (Papitalai, Admiralty Islands; Linden Harbor, New Pommerania).

Differs from *Atherina forskalii* in the lateral scales 35 to 40; first dorsal origin opposite 13th or 14th scale, that of second dorsal opposite 21st to 23rd scale; vent opposite 9th and 10th scale. Length 97 mm. (Weber and Beaufort)

East Indies.

Atherina valenciennei Bleeker.

Atherina valenciennei Bleeker: Nat. Tijds, Ned. Indie, vol. 5, p. 507, 1857 (type loc., Padang, Sumatra; Batavia, Java).

Atherina valenciennesi Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 135, 1926 (Simpson Harbor, New Pommerania).

Differs from *Atherina forskalii* and *A. duodecimalis* in the vent more advanced or opposite first third or middle of depressed ventrals. Length 95 mm.

East Indies, Melanesia.

Atherina villosa Duncker and Mohr.

Atherina villosa Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 135, fig. 10, 1926 (type loc., Tu Islands, New Pommerania; Friedrich Wilhelm Harbor, New Guinea).

Head 4 1/2; depth 6 1/3; D. IV-I, 10 to 12; A. I, 12 to 14; scales 44, 6 or 7 transversely, 17 predorsal, 5 between dorsals; eye 2 3/4 in head, little longer than snout; upper lip thick; mouth inferior, not quite reaching eye. Upper eye edge thickened, without lappet. Snout thickly covered with fine, stiff points, strong on orbital ring and border of gill opening. Ventral with short scale. First dorsal inserted midway in body; second dorsal inserted above middle of anal; anal inserted below end of first dorsal; pectoral equals head without snout. Ventral base opposite hind half of pectoral base. Clear yellowish white with bright brown underlaid lateral silvery stripe. Fins clear or all with sparse blackish pigment in rays. Large brown pigment spot in upper pectoral angle. Only first median dorsal row of scales, as well as first lateral dorsal row, strongly colored. Length 29 to 40 mm. (Duncker and Mohr)

Hepsetia insularum (Jordan and Evermann).

Atherina insularum Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 170, 1902 (1903) (type loc., Honolulu, Lahaina, Kailua, Hilo).—Jenkins: op. cit., p. 437 (Lahaina, Honolulu).—Snyder: op. cit., p. 523, 1902 (1904) (Laysan, Molokai).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 138, fig. 47, 1903 (1905) (Lahaina, Kailua, Hilo, Honolulu).

Hepsetia insularum Fowler: Copeia, no. 122, p. 82, Nov. 20, 1922 (Hawaiian islands).—Fowler: B. P. Bishop Mus., Bull. 22, p. 25, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 10, 1925 (Lisiansky).—Fowler: op. cit., Bull. 38, p. 8, 1927 (Honolulu).

This species is allied with *Hepsetia pinguis* and *Hepsetia lacunosa* in its gill rakers, but differs in its uniform pale pectorals.

Two from Maui obtained by the Wilkes Expedition, in the National Museum, 80 to 87 mm.

Also the type of *Atherina insularum*, 42 from Honolulu, 12 from Kailua and 11 from Hanalei River. In the Bishop Museum 12 from Honolulu; 1 from Waikiki October 29, 1922; 19 from Koolau Bay, Oahu, November 1, 1922 from Mr. Wilson; 9 from Laie Stream and beach, Oahu, November 5, 1922, from C. Montague Cooke, Jr. and C. Montague Cooke, III. On October 5, 1922 schools were frequent about the piers of Pearl City, Oahu. I found 1 in the Honolulu market December 15, 1922 and 50 December 23; 1 Lisiansky in 1923. In the Agassiz Museum 3 Hawaiian specimens obtained by Andrew Garrett, many years before the species was described. Length 70 to 90 mm. One in the Academy from Honolulu 53 mm. long.

Hepsetia lacunosa (Schneider).

Atherinam lacunosum (Forster) Schneider: Systema ichth., Bloch, p. 112, 1801 (type loc., New Caledonia).

Atherina lacunosa Lichtenstein: Descriptiones animalium, Forster, p. 298, 1844 (New Caledonia).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2,, vol. 6, p. 4, 1859 (Doreh, New Guinea).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 6, no. 1, p. 15, 1906 (Shortland Island, Solomons; Faté, New Hebrides).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., 26, p. 253, 1911 (Wotje Atoll, Marshalls; Moen, Truk Group, Carolines).

Atherina togar Thiollière: Fauna Woodlark, p. 183, 1857 (type loc., Woodlark Island).

Body slender, depth 6; spinous dorsal origin midway between caudal base and snout tip; anal base long as caudal peduncle; vent well behind ventral tips. Length 107 mm. (Ogilby)

In the Bishop Museum 10 from Shortland Island and 1 from Fatè. One in the Agassiz Museum from Moen. In the National Museum 16 from Wotje.

An imperfectly noticed *Atherina* is a specimen 60 mm. long described from Kanala, New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 305, 1861). It is apparently *A. togar*.

Queensland, Melanesia, Polynesia, Carolines.

Hepsetia pinguis (Lacépède).

Atherina pinguis Lacépède: Hist. nat. Poiss., vol. 5, pp. 371, 373, pl. 11, fig. 1, 1803 (no type locality).—Günther: Cat. fishes Brit. Mus., vol. 3, p. 399, 1861 (Aneiteum, New Hebrides).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 20, 1869 (Samoa; Viti Islands).—Alleyne and Macleay: Linn. Soc., New South Wales, Proc., vol. 1, p. 339, 1876 (Hall Sound, New Guinea).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 105, 1913 (Saonek, Waigiu).

Atherina lacunosa (non Schneider) Valenciennes: Hist. nat. Poiss., vol. 10, p. 337, 1835 (Waigiu).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 213, pl. 118, fig. E, 1877 (Vaté, New Calendonia; Aneiteum).—Günther: Rept. voyage "Challenger," vol. 1, p. 36, 1880 (Levuka, Fiji).

Body robust, depth 4 3/4; spinous dorsal origin nearer caudal base than snout tip; anal base longer than caudal peduncle; vent before ventral tips. Length 174 mm. (Ogilby)

Madagascar, Queensland, East Indies, Fiji, Samoa. Both this and the preceding have the pectorals dark terminally.

Hepsetia vaigiensis (Quoy and Gaimard).

Atherina vaigiensis Quoy and Gaimard: Voyage "Uranie," Zool., p. 335, 1825 (type loc., Waigiu; Ramak).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., 26, p. 255, 1911 (Makemo, Paumotus; Guam; Moen, Truk Group, Carolines).

Atherina cylindrica Valenciennes: Hist. nat. Poiss., vol. 10, p. 336, 1835 (type loc., Waigiu).

Head 3 1/4 to 3 1/3; depth 5 to 5 1/4; D. V-I, 10, 1; A. I, 14, 1 or I, 15, 1; scales 36 to 38 in median lateral series to caudal base and 3 to 5 more on latter; 7 series of scales transversely, 21 predorsal; snout 4 to 4 3/4 in head measured from its own tip; eye 2 2/5 to 2 1/2; maxillary 2 4/5 to 3; interorbital 2 2/3 to 2 3/4.

Body fusiform, rather slender, compressed, deepest at ventral origin. Caudal peduncle compressed, least depth 2 in its length or 3 1/2 to 3 2/3 in total head length. Head width 1 9/10 to 2 in its length. Snout obtuse, length 2/3 its width. Eye large, impinging on upper profile; hind pupil edge slightly behind middle in head length. Mouth moderate, mandible slightly protruded. Maxillary slender, largely concealed, extends slightly beyond front of eye. Teeth minute, in narrow band in jaws and on vomer, none on palatines. Interorbital slightly depressed. Gill rakers 6 + 20, lanceolate, slender, 2 in eye; gill filaments 2/5 of gill rakers. Scales with 3 or 4 basal points marginally, 19 to 24 vertical parallel striae over basal half. Second dorsal spine 2 1/8 to 2 1/2 in head; first branched dorsal ray 1 4/5 to 2 3/5; first branched anal ray 1 4/5 to 2 1/4; anal spine 4 1/3 to 4 4/5; caudal 1 1/6 to 1 1/3, emarginate; pectoral 1 3/5 to 1 4/5; ventral 1 3/4 to 1 7/8.

Pale brown generally, each scale on back with dark or dusky dots sprinkled marginally. Fins all pale. Dorsals, caudal and pectoral base sprinkled with dusky dots. Ends of both jaws sprinkled with dusky dots. Along side band of silvery-white wide as pupil. Side of head, iris and chest with bright silvery-white reflections. Length 38 to 50 mm.

In the Agassiz Museum 23 from Moen Island, Caroline Islands, obtained by the *Albatross*. The National Museum has 6 from Guam, 48 from Truck, 15 from Makemo, and 15 from Moen.

MELANOTAENIINAE

Body robust, strongly compressed, belly shortened. Dorsals rather close, first much higher than interspace; first spine usually pungent and usually 1 spine filamentous in male. Anal usually long. Fresh waters of Indo-Australasia. The fishes of this sub-family are all described by Weber and Beaufort in detail, so only the references are given here.

Craterocephalus nouhuysi (Weber).

Atherinichthys nouhuysi Weber: Leyden Mus., Notes, vol. 32, pt. 4, p. 229, 1910 (type loc., Lorentz River, Dutch South New Guinea).—Weber: Nova Guinea, vol. 9, pt. 4, p. 555, fig. 26, 1913 (Vander Sande River; Alkmaar; Beaufort River; Lorentz River).—Regan: Zool. Soc. London, Trans., vol. 20, pt. 6, p. 276, 1914 (Mimika River, New Guinea).

Craterocephalus nouhuysi Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 4, p. 278, fig. 71, 1922 (types).

Pseudomugil novae-guineae Weber.

Pseudomugil novae-guineae Weber: Nova Guinea, vol. 5, pt. 2, p. 232, pl. 13, fig. 5, 1908 (type loc., fresh waters Wagani River, Urama Basin, southern New

Guinea).—Weber: Senckenberg. Nat. Ges., Abhand., vol. 34, pt. 1, p. 25, 1911 (Waskai River at Sungi Manumbai, Wokam Island; Sungi Kololobo and Sungi Rubarratu, Kobroor Island, Aru Group).—Weber: Nova Guinea, vol. 9, pt. 4, p. 556, fig. 27, 1913 (Lorentz River at Alkmaar and Rivierkamp).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 4, p. 284, fig. 76, 1922 (types).

Melanotaenia nigrans (Richardson).

Atherina nigrans Richardson: Ann. Mag. Nat. Hist. London, vol. 2, p. 180, 1843 (type loc., Port Essington, fresh water streams).

Melanotaenia nigrans Regan: Zool. Soc. London, Trans., vol. 20, pt. 6, p. 279, 1914 (New Guinea; types of *Melanotaenia ogilbyi* and *Aristeus loriae*).

Aristeus loriae Perugia: Mus. Genova, Ann., vol. 34, p. 594, 1894 (type loc., Inawi, British New Guinea).

Melanotaenia maculata Weber: Nova Guinea, vol. 5, pt. 2, p. 239, pl. 11, fig. 4, 1908 (type loc., mouth of Merauke River, southern New Guinea, brackish water).—Weber: op. cit., vol. 9, pt. 4, p. 557, 1913 (Merauke).—Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 136, 1926 (Kaiserin Augusta River).

Melanotaenia ogilbyi Weber: Leyden Mus., Notes, vol. 32, pt. 4, p. 230, 1910 (type loc., Tumpel and Pandanus Morast at Sabang, Dutch southern New Guinea).—Weber: Nova Guinea, vol. 9, pt. 4, p. 560, fig. 28, 1913 (Trumpel and Sabang).—Duncker and Mohr: op. cit., vol. 42, p. 136, 1926 (Kaiserin Augusta River).

Melanotaenia multisquamata Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 4, p. 290, 1922 (type loc., Idenburg River, north New Guinea).

Anisocentrus rubrostriatus (Ramsay and Ogilby).

Nematocentrus rubrostriatus Ramsay and Ogilby: Linn. Soc. New South Wales, Proc., 2nd ser., vol. 1, p. 14, 1886 (type loc., Strickland River, New Guinea).

Anisocentrus rubrostriatus Regan: Zool. Soc. London, Trans., vol. 20, pt. 6, pp. 276, 281, pl. 31, fig. 3, 1914 (Setakwa and Lorentz rivers, New Guinea).

Melanotaenia dumasi Weber: Nova Guinea, vol. 5, pt. 2, p. 240, pl. 11, fig. 1, 1908 (type loc., Wa Udu River and Wagani River, southern New Guinea).—Weber: op. cit., vol. 9, pt. 4, p. 558, 1913 (Lorentz River; Regen Island; Rivierkamp; Sabang; Alkmaar; Bivak Island).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 4, p. 290, 1922 (south New Guinea).

Rhombosoma goldiei (Macleay).

Aristeus goldiei Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 269, 1883 (1884) (type loc., Goldie River, New Guinea).—Perugia: Mus. Genova, Ann., vol. 34, p. 548, 1894 (Haveri).

Rhombatractus goldiei Ogilby: Linn. Soc. New South Wales, Proc., vol. 21, p. 134, 1896 (name).

Rhombosoma goldiei Regan: Zool. Soc. London, Proc., p. 339, figs. 1-2, 1914 (notes on types).

Nematocentris novae-guineae Ramsay and Ogilby: Linn. Soc. New South Wales, Proc., 2nd ser., vol. 1, p. 13, 1886 (type loc., Strickland River, New Guinea).—Regan: Zool. Soc. London, Proc., p. 339, 1914 (type said to be mislaid).

Rhombatractus novae guineae Ogilby: Linn. Soc. New South Wales, Proc., vol. 21, p. 134, 1896 (name).

Rhombosoma novae-guineae Regan: Zool. Soc. London, Trans., vol. 20, pt. 4, pp. 276, 283, pl. 31, figs. 5-6, 1914 (Mimiki River, New Guinea).

Rhombatractus affinis Weber: Nova Guinea, vol. 5, pt. 2, p. 234, pl. 11, fig. 5, 1908 (type loc., Timena Bay at Sentami See mouth; Sekanto and Wagani River).

Rhombatractus kochii Weber: Nova Guinea, vol. 5, pt. 2, p. 237, pl. 11, fig. 6, 1908 (type loc., Wasserlaufe in Merauke River mouth and Etna Bay, southern New Guinea, brackish water).

Rhombatractus kochi Weber: Nova Guinea, vol. 9, pt. 4, p. 562, 1913 (Alkmaar and Beaufort River).

Rhombatractus weberi Regan: Ann. Mag. Nat. Hist. London, 8th ser., vol. 1, p. 155, 1908 (type loc., Sogeri, British New Guinea).

Rhombatractus catherinae Beaufort: Zool. Anzeiger, vol. 36, p. 250, 1910 (type loc., Wai Semie, Wei Meniel, Bajon River, Rabiai River, Waigiu).—Beaufort: Bijd. Dierk. Amsterdam, p. 106, pl. 2, fig. 1, 1913 (Rabiai, Wai Semi, Wai Menil, Bajon).

Rhombatractus praecox Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 4, p. 298, 1922 (type loc., Mamberamo River, north New Guinea).

Rhombatractus vanheurni Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 4, p. 299, 1922 (type loc., Idenburg River and Doorman River, north New Guinea).

Rhombosoma lorentzi (Weber).

Rhombatractus lorentzii Weber: Nova Guinea, vol. 5, pt. 2, p. 236, 1908 (type loc., Tawarin River, northern New Guinea).—Weber: op. cit., vol. 9, pt. 4, p. 564, 1913 (Sermowai River, northern New Guinea).—Regan: Zool. Soc. London, Trans., vol. 9, pt. 4, p. 284, 1913 (Sermowai River).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 4, p. 300, fig. 80, 1922 (Sermowai, Tawarin, Mamberamo).

Centratherina crassispinosa (Weber).

Rhombatractus crassispinosus Weber: Nova Guinea, vol. 9, pt. 4, p. 567, 1913 (type loc., Buarin, Begowri River and Kaiserin Augusta River, New Guinea).

Centratherina crassispinosa Regan: Zool. Soc. London, Trans., vol. 20, pt. 4, p. 283, pl. 31, fig. 2, 1914 (cotype).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 4, p. 306, fig. 81, 1922 (types).

Chilatherina fasciata (Weber).

Rhombatractus fasciatus Weber: Nova Guinea, vol. 9, pt. 4, p. 565, 1913 (type loc., mouth of Sermowai River, Buarin, Njao and tributary Kaiserin Augusta River, New Guinea).

Chilatherina fasciatus Regan: Zool. Soc. London, Trans., vol. 20, p. 282, pl. 31, fig. 4, 1914 (cotype).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 4, p. 308, 1922 (types).

Chilatherina sentaniensis (Weber).

Rhombatractus sentaniensis Weber: Nova Guinea, vol. 5, pt. 2, p. 235, pl. 11, fig. 3, 1908 (type loc., Lake Sentani, northern New Guinea).—Weber: op. cit., vol. 9, pt. 4, p. 564, 1913 (Lake Sentani).

Chilatherina sentaniensis Regan: Zool. Soc. London, Trans., vol. 20, pt. 4, p. 282, 1914 (cotypes).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 4, p. 309, fig. 82, 1922 (types).

Glossolepis incisus Weber.

Glossolepis incisus Weber: Nova Guinea, vol. 5, pt. 2, p. 241, pl. 11, fig. 7, a-c, 1908 (type loc., Lake Sentani, northern New Guinea).—Weber: op. cit., vol. 9, pt. 4, p. 562, 1913 (Lake Sentani and Cape Djuar at Humboldt Bay).—Regan: Zool. Soc. London, Trans., vol. 20, pt. 6, p. 281, 1914 (Lake Sentani).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 4, p. 310, fig. 83, 1922 (type; pond near Humboldt Bay).

MUGILIDAE

Mugil argenteus Quoy and Gaimard.

Mugil argenteus Quoy and Gaimard: Voyage "Uranie," Zool., p. 238, pl. 59, fig. 3, 1824 (very bad) (type loc., Port Jackson, Australia).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 21, 1869 (Samoa).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 214, 1877 (Samoa).

Head 4 2/3 in total; depth 4; D. IV-I, 8; A.

III, 9; lateral scales 28, transversely 10, predorsal 18. Snout shorter than eye. Eye with broad lids. Maxillary concealed. Upper lip moderately thick, truncated. Mouth would form obtuse angle. Interorbital 2 1/2, flat. No axillary prectoral scale. Soft dorsal and anal scaleless. Spinous dorsal begins nearer caudal than snout tip or above tenth lateral scale; second dorsal begins over 20th lateral scale or middle of anal fin; caudal emarginate, black-edged; pectoral long as head without snout, reaches ninth lateral scale. (Günther)

This species is readily distinguished by its large body scales.

Mugil anpinensis Oshima (Carnegie Mus., Ann., vol. 13, p. 245, pl. 11, fig. 1, 1922) is certainly very close and is likely synonymous. It is alleged to differ in the exposed maxillary, 16 predorsal scales, and spinous dorsal origin midway between snout tip and caudal base.

South Australia, Samoa.

Mugil dussumieri Valenciennes.

Mugil dussumieri Valenciennes: Hist. nat. Poiss., vol. 11, p. 109, 1836 (type loc., Bombay; Coromandel).—Weber: Nova Guinea, vol. 5, pt. 2, p. 243, 1908 (Tawarin River and Merauke River mouth, north New Guinea).—Weber: op. cit., vol. 9, pt. 4, p. 569, 1913 (Sermowai River mouth, north New Guinea).—Fowler: B. P. Bishop Mus., Bull. 22, p. 7, 1925 (Guam).

Mugil sundanensis Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 362, 1882 (New Guinea).

Upper lip thin. Adipose eyelid covers only hind third of eye. Scales 29 between gill opening and caudal base and 4 more larger ones on latter. Maxillary exposed. Snout measured in profile equals eye. Origin of first dorsal midway between eye center and caudal base in adult, slightly more advanced in young. Pectoral 1 1/3 in head. Soft dorsal and anal densely scaled, former inserted over middle of latter.

Two in the National Museum from New Guinea, 134 and 266 mm.

India, East Indies, Australia.

Mugil tade Forskål (fig. 26).

Mugil crenilabis tade Forskål: Descriptiones animalium, pp. xiv, 74, 1775 (type loc., Arabia).

Mugil planiceps Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 66, 1900 (1901) (Guam).—Weber: Nova Guinea, vol. 9, pt. 4, p. 569, 1913 (Bivak Island and Lorentz River).

Mugil belanak Weber: Nova Guinea, vol. 5, pt. 2, p. 244, 1908 (Moso in Tami Basin, north New Guinea).

Head 3 1/2 to 3 3/4; depth 3 1/4 to 3 2/3; D. IV-I, 8, 1; A. III, 9, 1; scales 30 to 33 in median lateral series to caudal base and 3 more on latter; 10 to 12 scales transversely, 18 or 19 predorsal; snout 3 7/8 to 4 in head; eye 3 3/5 to 4; maxillary 4 1/6; interorbital 2 7/8.

Body well compressed, deepest at spinous dorsal. Caudal peduncle strongly compressed, least depth equals its length or 2 1/5 in head, 1 1/8 in postorbital. Head width 1 2/5 to 1 2/3 in its length. Snout depressed, broadly convex in profile, length 2/5 its width. Eye with hind edge midway in head length; diameter little greater than snout, 1 1/3 in interorbital; lids narrowly developed, hind one extending but slightly over iris. Mouth wide, mandibular rami meeting at wide angle. Maxillary slightly visible when closed. Lips thin. No teeth. Nostrils well separated; front one at 2/5 of snout; hind one larger, elevated, nearer eye than front one. Interorbital broadly convex. Preorbital edge minutely dentate. Gill rakers 15 to 20 + 38 to 52, finely lanceolate, 1 2/3 to 1 3/4 in gill filaments, which 1 1/8 in eye. Scales with 5 or 6 basal radiating striae, edge scalloped; no apical denticles, or 54 cutaneous flaps as fringe; circuli very fine. Second dorsal, anal and caudal largely scaly basally. First dorsal spine 1 2/3 in head, origin midway between front pupil edge and caudal base, 2 scales between depressed dorsal fin and soft dorsal origin, which opposite twenty-second scale of lateral scale; first branched dorsal ray 1 7/8 in head, fin edge concave; anal with 1/3 its base in advance of soft dorsal, third spine 2 9/10 in head, first branched ray 1 1/2; caudal 1, emarginate; pectoral but slightly less than head, reaches eleventh lateral scale or opposite spinous dorsal origin, scaly flap 1/3 of fin; ventral 1 2/5 in head, axillary scale 2/5 of fin.

Uniformly colored, back pale olivaceous, sides and below whitish, with silvery reflections. No dark spot at pectoral base. Iris whitish.

One in the Agassiz Museum from Apiang, Kingsmills, length 90 mm. The Bishop Museum has 3 from Guam, 92 to 152 mm.

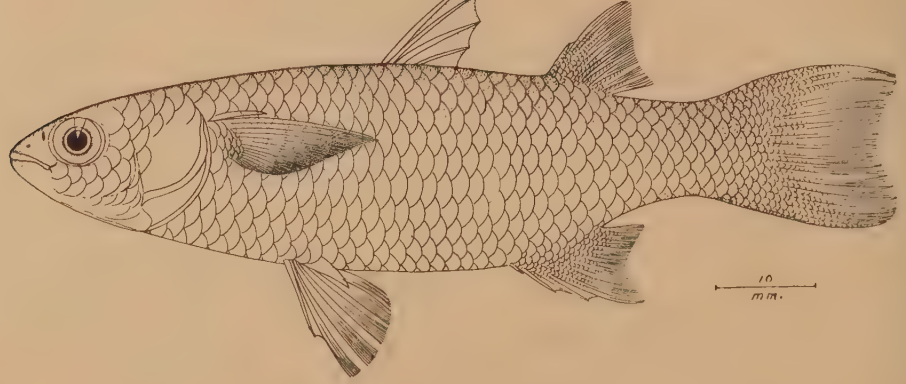

FIGURE 26.—Drawing of *Mugil tade*.

Mugil tade Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 4, p. 236, 1922 (New Guinea).

Mugil decem-radiatus (non Günther 1861) Schmeltz: Mus. Godeffroy, Cat. 4, p. 21, 1869 (Kandavu).

Mugil kandavensis Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 215, 1877 (type loc., Kandavu).

Red Sea, India, East Indies, China, Guam, Kandavu.

Mugil engeli Bleeker.

Mugil engeli Bleeker: Nat. Tijds. Ned. Ind., vol. 16, p. 277, 1858-59 (description in key); vol. 15, p. 385,

1858 (type loc., Batavia, Java, name only).—Fowler: B. P. Bishop Mus., Bull. 22, p. 32, 1925 (Samoa).

Mugil kelaartii Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 215, pl. 121, fig. A, 1877 (Tahiti and Raiatea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 6, no. 1, p. 15, 1906 (Tahiti).

Mugil kelaarti Günther: Rept. voyage "Challenger," vol. 1, p. 58, 1880 (Tongatabu).

Mugil kellartii Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1416, 1906 (Upolu).

Head 3 1/3 to 3 3/5; depth 3 1/2 to 3 7/8; D. IV-I, 8, 1; A. III, 9, 1; scales 32 or 33 in median lateral series to caudal base and 3 more on latter; 11 scales transversely, 20 predorsal; snout 3 4/5 to 4 1/8 in head; eye 3 4/5 to 4; maxillary 4 to 4 1/2; interorbital 2 1/3 to 2 3/5.

Body well compressed, deepest at spinous dorsal origin. Caudal peduncle well compressed, least depth 1 1/8 in its length or 2 2/5 to 2 3/5 in head. Head width 1 3/5 to 1 2/3 in its length. Snout obtuse, broad, length in profile 2/5 to 1/2 its width. Eye center at first third in head; diameter little greater than snout or 1 4/5 in interorbital; adipose-lid marginal, very narrow or only little evident posteriorly. Mouth broad, lower jaw slightly included, rami would form obtuse angle. Maxillary concealed. Lips firm, moderate. No teeth. Front nostril at first 2/5 in snout; hind one longer vertical slit, higher, midway between front one and eye. Interorbital broadly convex. Lower edge of preorbital minutely serrated. Gill rakers 38 + 44, finely lanceolate, about half length of gill filaments, which equal eye. Scales with 5 or 6 basal radiating striae, also 1 or 2 incomplete auxiliaries, edge scalloped; circuli fine. Pectoral with pointed axillary scale 2 3/5 in fin; depressed spinous dorsal followed by 3 scales before soft dorsal; soft vertical fins finely scaled basally. First dorsal spine 1 3/4 in head; first branched dorsal ray 2 to 2 1/8; third anal spine 1 7/8 to 2 4/5; first branched anal ray 1 3/4; caudal 1, deeply emarginate; pectoral 1 1/8 to 1 1/6; ventral 1 2/5 to 1 1/2.

Back olivaceous, sides and below paler, with light reflections, especially on side of head. Vertical fins and pectorals dull brown. Ventral pale or light brown. Iris pale.

In the Agassiz Museum 1 from Strong Island, 88 mm. long, obtained by Rev. B. G. Snow. Also a specimen 180 mm. long from Ponapé.

There is little doubt that *Mugil kelaartii* Günther is a synonym. Recently described by Oshima as *Mugil kelaartii* from Formosa.

East Indies to Tahiti and Samoa.

Mugil longimanus Günther.

Mugil longimanus Günther: Cat. fishes Brit. Mus., vol. 4, p. 248, 1861 (type loc., East Indies).—Fowler: B. P. Bishop Mus., Bull. 38, p. 9, 1927 (Christmas and Palmyra islands).

Similar to *Mugil engeli* in the concealed maxillary when mouth closes, position of dorsal origin and depth of caudal peduncle. Differs in the pectorals nearly long as head and caudal peduncle usually deeper.

The Bishop Museum has 3 from Christmas Island and 2 from Palmyra Island, largest 200 mm.

India, Pinang, East Indies, Philippines, Queensland, Polynesia.

Mugil trichilus Vaillant and Sauvage.

Mugil trichilus Vaillant and Sauvage: Rev. Mag. Zool., 3rd ser., vol. 3, p. 287, 1875 (type loc., Hawaiian [illegible]: B. P. Bishop Mus., Bull. 22, p. 32, 1925 [illegible]

Mugil caldwelli Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 524, pl. 19, fig. 4, 1900 (type loc., Samoa).

Liza caldwelli Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 747, 1903 (type).

Mugil kelaartii (non Günther) Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 500, 1900 (Hawaii).—Fowler: op. cit., p. 743, 1903 (same materials).

Differs from *Mugil engeli* in the spinous dorsal origin little nearer caudal base than snout tip.

In the Academy the type of *Mugil caldwelli* and 2 Hawaiian specimens. In the National Museum 1 from Tongabatu, 1 from Fiji and 3 from Tahiti, all obtained by the Wilkes Expedition. Of these the first is the largest, or 145 mm. long.

India, East Indies, Melanesia.

Mugil speigleri Bleeker.

Mugil speigleri Bleeker: Nat. Tijds. Ned. Indie, vol. 15, p. 386, 1858 (type loc., Batavia, Java; no description); op. cit., vol. 16, p. 279, 1858-59 (description in key).—Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 131, 1926 (Liebliche Island, New Pommerania).

Agrees with *Mugil cunnesius* in the number of scales, but the dorsal and anal scaly (not scaly in *M. cunnesius*), pectorals equal head or with age somewhat longer (much shorter than head in *M. cunnesius*). Reaches 225 mm. according to Weber and Beaufort.

Mugil cunnesius Valenciennes.

Mugil cunnesius Valenciennes: Hist. nat. Poiss., vol. 11, p. 84, 1836 (type loc., Moluccas; Malabar; Bombay).—Regan: Zool. Soc. London, Trans., vol. 20, pt. 6, p. 276, 1914 (Mimika River, New Guinea).

Differs from *Mugil engeli* chiefly in the more numerous lateral scales, 42 or 43 and the exposed maxillary.

Red Sea to East Indies.

Mugil sordidus Duncker and Mohr.

Mugil sordidus Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 132, fig. 6, dorsal fins, 1926 (type loc., Liebliche Islands and Mowe Harbor, New Pommerania; Saha, Admiralty Islands; Langemak Bay, New Guinea).

Head 4 in total; depth 5; D. IV-I, 8 to 10; A. III, 9; scales 35 to 40, transversely 12. Eye equals snout; adipose-lid broader in front than behind. Lips narrow, without papillae. No teeth in jaws. Preorbital strongly toothed. First dorsal and paired fins with keeled scales. Second dorsal, anal, caudal and pectoral bases scaled. Dorsals well separated, first inserted between caudal base and front eye edge; second dorsal inserted above middle of anal; caudal well forked. Back brown, side silvery. First dorsal with black pigment; second dorsal with black pigment on membranes, lobe reaches half fin length. Caudal lightly pigmented in terminal half, base dark. Pectoral with dark spot at upper axil. Length 40 to 46 mm. (Duncker and Mohr).

Mugil buchanani Bleeker.

Mugil buchanani Bleeker: Bataviaasch Genoot., Verh. (Bengal), vol. 25, p. 99, 1853 (type loc., Hooghly River, Calcutta, India).—Pellegrin: Mus. Nat. Hist. Paris, Bull. 4, p. 229, 1898 (Agrigan, Mariannes).

Head 4 2/3 in total; depth 4 2/3; D. IV-I, 8; A. III, 9; scales 34 or 35 in lateral series, 12 transversely, 19 predorsal; eye 4 in head; interorbital 2 1/2. Snout obtuse. Eye 3/4 diameter from snout tip, without lids. Upper lip thin, forms snout end. Maxillary concealed. Mouth would form obtuse angle. Interorbital slightly convex. Short pointed axillary pectoral scale. Soft dorsal and anal scaled. First dorsal inserted nearer caudal base than snout tip, spines equal preorbital, origin at eighth lateral scale. Soft dorsal opposite anal or at

19th lateral scale. Caudal deeply forked. Least depth of caudal peduncle equals head. Pectoral nearly long as head, reaches ninth lateral scale. Greenish above, silvery on sides and beneath. Dark spot superiorly at pectoral base. Length 305 mm. or more. (Day)

East Africa, India, Carolines.

Mugil vaigiensis Quoy and Gaimard (fig. 27).

Mugil vaigiensis Quoy and Gaimard: Voyage "Uranie," Zool., p. 337, pl. 59, fig. 2, 1825 (type loc., Waigiu).—Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).—Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 131, figs. 4-5, young, 1926 (Drugul, Saha-Nuro, Admiralty Islands; Liebliche Island, southwest coast, Simpson Harbor, Linden Harbor, Rein Bay, New Pommerania; Friedrich Wilhelm Harbor, New Guinea).—Fowler: B. P. Bishop Mus., Bull. 38, p. 8, 1927 (Christmas and Palmyra islands).

Mugil waigiensis Peters: Akad. Wiss. Berlin, Monatsb., p. 842, 1876 (1877) (Bougainville Island).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 216, pl. 121, fig. B, 1877 (Society Islands, Tahiti).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 362, 1882 and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 256, 1911 (Tongatabu, Tonga Islands).

Mugil melanochir (Kuhl and Van Hasselt) Valenciennes: Hist. nat. Poiss., vol. 11, p. 106, 1836 (type loc., Java; Guam).

Mugil tegobuan Thoillière: Fauna Woodlark, p. 184, 1857 (type loc., Woodlark Island).

Mugil delicatus Jouan: Soc. Cherbourg, Mem., vol 21, p. 333, 1877-78 (on Jouan, 1861).

Mugil rossi Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 107, 1913 (Saonek, Waigiu; Sarong, New Guinea).

A strongly marked species, with the fins blackish edged, the pectorals entirely black in the young.

In the Bishop Museum 2 from Rarotonga, 2 from Mangareva, 1 each from Raiatea, Agaña on Guam, Tuamotus and Faté. Largest 337 mm. In the National Museum 2 from Apia, 5 from Funafuti, 2 from Tonga, 7 from Makemo, and 1 each from Tongatabu, Rangiroa, and Suva. In the Agassiz Museum 3 from Suva,

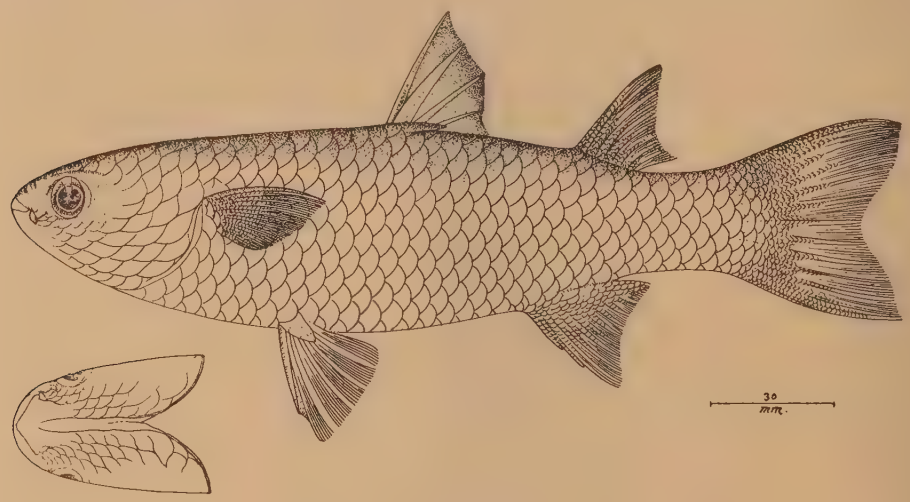

FIGURE 27.—Drawing of *Mugil vaigiensis*.

New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 65, 1900 (Guam).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1416, 1906 (Upolu).

Liza waigiensis Seale: B. P. Bishop Mus., Occ Papers, vol. 6, no. 1, p. 15, 1906 (Mangareva; Faté; Shortland Island; Raiatea; Rarotonga).

Liza vaigiensis Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 257, 1911 (Suva, Fiji; Funafuti, Ellice Islands; Marshalls; Moen, Truk Group, Carolines; Makemo and Rangiroa, Paumotus).

Mugil macrolepidotus Valenciennes: Hist. nat. Poiss., vol. 11, p. 99, 1836 (Waigiu; Borabora; Vanicolo).—Jouan: Soc. Cherbourg, Mem., vol. 8, p. 316, 1861 (New Caledonia).

Mugil melinopterus Valenciennes: Hist. nat. Poiss., vol. 11, p. 108, pl. 313, 1836 (type loc., Vanicolo).—Günther: Cat. fishes Brit. Mus., vol. 3, p. 452, 1861 (Tonga Islands).—Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 130, 1926 (Hansa Bay, New Guinea).

Mugil melanopterus Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 218, 1881 (Tonga).

Liza melinoptera Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 217, 1905 (1906) (Apia; Pago Pago).—Jordan and Dickerson: United States Nat. Mus., Proc., vol. 34, p. 607, 1908 (Suva, Fiji).—Kendall

14 from Guam, 10 from the Marshall Islands, 4 from Moen, 8 from the Society Islands, 7 from the Kingsmill Islands, 1 from Rangiroa, and 1 from Tongatabu.

Red Sea, East Africa, India, East Indies, China, Australia, Tahiti.

Mugil macrolepis A. Smith.

Mugil macrolepis A. Smith: Ill. Zool. S. Af., no pagination, pl. 28, fig. 2, 1849 (type loc., rivers and fresh water lakes of South Africa).

Mugil borneensis Kner: Reise "Novara," Fische, vol. 1, p. 5, p. 228, 1865 (Tahiti).

Liza borneensis Kendall and Goldsborough: Mus Comp. Zool., Mem., 26, p. 258, 1911 (Kusaie and Savaii).

Mugil troschelii Schmeltz: Mus. Godeffroy, Cat. 4, p. 21, 1869 (Viti Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 362, 1882 (New Guinea).

Mugil troscheli Weber: Nova Guinea, vol. 9, pt. 4, p. 569, 1913 (Sĕkå Dorfern east of Humbodlt Bay).—Regan: Zool. Soc. London, Trans., vol. 20, pt. 6, p. 276, 1914 (Mimika River).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 4, p. 248, 1922 (North New Guinea).—Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 130, 1926 (Liebliche Island,

Varangoi River, Zoller Bay and Simpson Harbor, New Pommerania).

Liza troscheli Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 217, 1905 (1906) (Pago Pago).

Liza troschelii Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 256, 1911 (Makemo, Bora Bora, Ponape, Jaluit, Suva, Aitutaki, Funafuti, Tonga, Ewa).

Mugil compressus Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 217, pl. 123, fig. A 1881 (Samoa, Ponapé, Kandavu, Fiji).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 269, 1883 (Normanby Island, New Guinea, in fresh water).

Liza compressa Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 256, 1911 (Kusaie).

Mugil rechingeri Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1416, 1906 (type loc., Upolu, Samoa).

Head 3 2/3; depth 3 1/3; D. IV-I, 8, 1; A. III, 9, 1; scales 30 in median lateral series to caudal base; 12 scales transversely, 19 predorsal; snout 4, in head; eye 3 2/3; maxillary 4 7/8; interorbital 2 4/5.

Body strongly compressed. Caudal peduncle similar, depth 2 1/3 in head. Head width 1 1/2 its length. Snout depressed, convex in profile, length 2/5 its width. Eye greater than snout, 1 1/2 in interorbital, center at first third in head; lids little developed, only as narrow cutaneous margin. Mouth broad, mandibular rami meeting at an obtuse angle. No teeth. Nostrils well separated; front one at middle in snout length; hind one larger, higher, midway between front one and eye. Interorbital broadly convex. Preorbital inconspicuously dentate. Gill rakers 20+52, lanceolate, slender, fine, 1 1/4 in gill filaments, which 1 1/4 in eye. Scales with 6 basal radiating striae, edge scalloped; no apical denticles; circuli very fine. First dorsal spine 1 9/10 in head; second dorsal spine 2; third anal spine 3; pectoral 1 1/6; ventral 1 3/4.

Back pale olivaceous, sides and under surface pale to whitish. Dorsals and pectorals all pale brownish, other fins whitish. Iris pale brown above, whitish below. Length 125? mm. (caudal damaged).

In the Agassiz Museum 2 from Kusaie, 1 Vavau, 1 Tonga, 8 Ewa, 1 Ponapé, 4 Jaluit. The National Museum has 16 Samoan specimens, mostly from Apia and Pago Pago, 3 Tonga, 3 Vavau, 3 Suva, 9 Guam, 18 Makemo, 10 Aitutaki, 30 Bora Bora.

The species *Mugil rechingeri* was based on specimens 120 to 130 mm. long, which appear to agree with *M. macrolepis* in most every respect.

South and east Africa to the East Indies, China, Japan, Samoa, Fiji, Society Islands.

Mugil atherinoides Duncker and Mohr.

Mugil atherinoides Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 133, figs. 7-8, 1926 (type loc., Cape Beechy, Simpson Harbor, Varangoi, Jacquinot Bay and Montague Bay, New Pommerania).

Head 2 4/5; depth 3 1/2; D. IV-I, 8 to 10; A. II, 9 to 11; scales 29 to 33; eye equals caudal peduncle depth or 2 3/4 in head from snout tip, greater than snout; mouth small, scarcely reaches eye; row of fine teeth in upper jaw and broadly rounded lower jaw toothless; lips small, not fleshy; postorbital part of head equals eye. Only scales on belly ctenoid. First dorsal origin nearer caudal base than snout tip or midway between caudal base and front eye edge; second dorsal begins above middle of anal; anal begins behind end of first dorsal; pectoral reaches first dorsal origin; ventral inserted midway between hind eye edge and anal origin, shorter than pectoral. Yellowish brown, back darker. Length 10 to 24 mm. (Duncker and Mohr)

Mugil seheli Forskål.

Mugil crenilabis seheli Forskål: Descriptiones animalium, pp. 14, 73, 1775 (type loc., Lohaja, Red Sea).

Mugil seheli Fowler: B. P. Bishop Mus., Bull. 22, p. 32, 1925 (Samoa).—Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 131, 1926 (Saha, Admiralty Islands).

Mugil caeruleomaculatus Lacépède: Hist. nat. Poiss., vol. 5, pp. 385, 389, 1803 (no type locality [probably Indo-Pacific]).—Duncker and Mohr: op. cit., vol. 42, p. 131, 1926 (Hansa Bay, New Guinea).

Mugil coeruleomaculatus Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).—Bleeker, Arch. Neerl. Sci. Nat., vol. 13, p. 38, 1878 (New Guinea).

Liza caeruleomaculata Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 217, 1905 (1906) (Apia).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 607, 1908 (Suva, Fiji).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 256, 1911 (Moen and Kusaie, Carolines; Vavau and Tongatabu, Tonga islands; Suva, Fiji; Guam).

Mugil axillaris Valenciennes: Hist. nat. Poiss., vol. 11, p. 97, 1836 (type loc., New Guinea; Mauritius).—Bleeker: Soc. Ind. Neerl., Act., no. 2, vol. 6, p. 34, 1871 (Doreh, New Guinea).—Alleyne and Macleay: Linn. Soc. Proc., New South Wales, Proc., vol. 11, p. 341, 1876 (Yule Island, Hall Sound, New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 216, pl. 120, fig. B, 1877 (Samoa).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 362 1882 (New Guinea).—Seale: Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 66, 1900 (1901) (Guam).

Mugil parsia (non Buchanan-Hamilton) Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 216, pl. 120, fig. B, 1876 (Samoa; Fiji).—Seale: Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 66, 1901 (Guam).

Agonostomus dorsalis Streets: U. S. Nat. Mus., Bull. no. 7, p. 102, 1878 (type loc., (Samoa).

Mugil bleekeri Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 107, 1913 (Saonek, Waigiu).

In the Bishop Museum 1 from Guam and 2 from Shortland Island, Solomon Islands. Two in the National Museum from Kusaie, 8 from Apia, 30 from Vavau, 15 from Neven, and 3 from Guam. In the Agassiz Museum 1 from Apia, largest examined and measures 278 mm. Also 10 from Tongatabu and 1 from Suva.

Red Sea, East Africa, East Indies, China, Caroline Islands, Samoa, Fiji. Reaches 465 mm.

Mugil cephalus Linné.

Mugil cephalus Linné: Systema nat., 10th ed., p. 316, 1758 (type loc., European Ocean).—Kittlitz: Denkw. Reise Mikronesien, vol. 2, p. 20, 1858 (Ualan).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 438, 1902 (1903), (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 139, 1903 (1905) (Honolulu, Kailua).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 6, no. 1, p. 17, 1906 (Tahiti; Raiatea; Shortland Island).—Fowler: Copeia, no. 122, p. 82, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 25, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 10, 1925 (Laysan, Lisiansky, Ocean Island, French Frigates Shoal).—Fowler: op. cit., Bull. 38, p. 9, 1927 (Molokai, Ocean Island, Honolulu).

Mugil cephalotus Eydoux and Souleyet: Voyage "Bonite," Zool., vol. 1, p. 175, pl. 4, fig. 4, 1841 (Hawaiian islands).—Streets: United States Nat. Mus., Bull.

no. 7, p. 73, 1877 (Honolulu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 362, 1882 (New Guinea).

Mugil dobula Günther: Cat. fishes Brit. Mus., vol. 3, p. 420, fig. of head, 1861 (type loc., Perth Water, West Australia; fresh waters of Aneiteum).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 214, pl. 120, fig. A (text fig. of head) 1877 (Aneiteum; Hawaiian islands).—Günther: Rept. voyage "Challenger," vol. 1, p. 61, 1880 (Hilo; Hawaii).—Steindachner: Akad. Wiss. Wien, Denks., vol. 70, p. 501, 1901 (Honolulu).

Mugil albula Snyder: U. S. Fish Comm., Bull., vol. 22, p. 523, 1902 (1904) (Waimea River, Huleia River, Hanapepe River, Kauai; Honolulu; off Molokai).

Head 3 to 4; depth 3 1/2 to 4 1/5; D. IV-I, 8; A. III, 8, in young II, 9; scales 35 to 40 between gill opening and caudal base; 13 scales transversely at soft dorsal and anal; 17 predorsal scales; snout 4 to 4 1/5 in head; eye 3 1/5 to 4; maxillary 3 1/2; interorbital 2 2/3.

Body robust, slightly compressed. Head subconic. Eye anterior, moderate; adipose-lid nearly covers iris, pupil alone exposed. Lower jaw slightly included in mouth. Maxillary concealed. Row of very small feeble ciliate teeth along upper lip, none on lower. Mandible narrow space from symphysis to hind edge of lip equal to greatest mouth width. Head scaly; soft dorsal and anal almost naked. Front base of spinous dorsal midway between snout tip and caudal base. Soft dorsal concave, length 1 3/5 in head. Anal like second dorsal, except less concave. Caudal deeply forked, upper lobe slightly longer. Pectoral not quite reaching spinous dorsal. Olivaceous gray above, silvery-white beneath. Scales on back with longitudinal slightly darker streaks.

In the Academy 4 from Honolulu, 10 Waiahua, 3 Kailua, 1 Molokai, largest 268 mm. In the Bishop Museum 4 from Honolulu, 19 from Waikiki received from C. H. Edmondson in 1922. One specimen from the Honolulu series, 170 mm. is interesting as evidently bitten by some predatory fish so that its caudal fin and caudal peduncle gone and the trunk healed. Over 1500 specimens examined in the markets of Honolulu, where quantities could usually be seen every day. One from Laysan, 3 Lisiansky, 3 Ocean Island, 2 French Frigates Shoal. In the National Museum 22 Hawaiian specimens, also a large series of young.

In the Agassiz Museum 9 from Honolulu obtained by W. H. Jones in 1874, 2 labeled Oahu, 3 adults from Andrew Garrett also Hawaiian, 1 young from Guam in the Owston Collection, and 1 young from Ascension Island in the Marshalls, obtained by Rev. A. A. Strong in 1877.

Circumtropical.

Mugil tongae Günther.

Mugil tongae Günther: Rept. voyage "Challenger," vol. 1, p. 58, 1880 (type loc., Tongatabu).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 217, 1881 (type).

Head 3 1/2; depth 4; D. IV-I, 8; A. III, 8; lateral scales 45, transversely 16, predorsal 26. Snout very broad. Eye with broad lids. Lips thin. Maxillary narrowly exposed. Mouth cleft would slightly exceed right angle. Interorbital 2 1/2 in head. First dorsal spines long as head, midway between snout tip and caudal base or at 13th lateral scale; soft dorsal inserted opposite 27th scale; pectoral reaches 11th scale. Uniform. Length 165 mm. (Günther)

Mugil crenilabis Forskål.

Mugil crenilabis Forskål: Descriptiones animalium, pp. 14, 73, 1775 (type loc., Red Sea).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 108, 1913 (Saonek, Waigiu).—Fowler and Bean: United States Nat. Mus., Proc., vol. 71, p. 14, 1927 (Tahiti).—Fowler: B. P. Bishop Mus., Bull. 38, p. 10, 1927 (Baker and Palmyra islands).—Whitley: Australian Mus., Records, vol. 16, no. 1, p. 11, 1927 (Santo, New Hebrides).

Mugil crenilabris Streets: U. S. Nat. Mus., Bull. no. 7, p. 93, 1877 (Christmas Island, Fanning).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 219, pl. 122, fig. A, 1881 (Kingsmills; Society Islands; Paumotus; Ponapé).—Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 130, 1926 (Jaequinot Bay, New Pommerania).

Querimana crenilabris Seale: B. P. Bishop Mus., Occ. Papers, vol. 6, no. 1, p. 15, 1906 (Tahiti).

Liza crenilabis Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 258, 1911 (Guam; Makemo, Paumotus; Jaluit, Marshalls).

Mugil cirrhostomus (Forster) Schneider: Systema ichth., Bloch, pp. 121, 32, 1801 (type loc., Pacific Ocean).

Valenciennes: Hist. nat. Poiss., vol. 11, p. 94, 1836 (New Ireland).—Lichtenstein: Descriptiones animalium, Forster, pp. 198, 257, 1844 (Tahiti, Tanna).

Mugil neocalidonicus Castelnau: Zool. and Acc. Soc. Victoria, Proc., vol. 2, p. 116, 1873 (type loc., Noumea, New Caledonia).

Mugil papillosus Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 270, fig. (head), 1883 (type loc., Normanby Island, in fresh water, southeast New Guinea).

Head 4; depth 3 1/2; D. IV-I, 1, 6, 1; A. III, 1, 9, 1; scales 38 between gill opening and caudal base medianly; 12 scales transversely between dorsal and anal origins; 22 predorsal scales; snout 3 1/2 in head; eye 4 1/5; mouth width 3 1/3; interorbital 2 1/5; head width 1 2/5. Six scales between depressed spinous dorsal tip and soft dorsal origin. Reaches 500 mm.

In the Bishop Museum 1 from Raiatea in Society Islands, 2 from Fatè in New Hebrides, and 2 from Tahiti. Largest 354 mm. In the National Museum 1 from Christmas Island, 1 from Jaulit, and 2 from Guam. In the Agassiz Museum 4 from Makemo, 1 from the Society Islands and 1 from Apiang in the Kingsmills, both the latter from Andrew Garrett.

The descriptions of both *M. papillosus* and *M. neocalidonicus* appear to fit *M. crenilabis*.

Red Sea, Madagascar to the East Indies, Japan, Tahiti.

Mugil heterocheilos Bleeker.

Mugil heterocheilos Bleeker: Nat. Tijds. Ned. Indie, vol. 9, p. 198, 1855 (type loc., Batjan Island).

Mugil heterochilus Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 130, 1926 (New Pommerania and Admiralty Islands).

Differs from *Mugil crenilabis* in lower lip without papillae and thick upper lip with or without one indistinct series of obtuse papillae. Pectoral equals or longer than head. Length 228 mm. according to Weber and Beaufort.

East Indies, Melanesia.

Mugil labiosus Valenciennes.

Mugil labiosus Valenciennes: Hist. nat. Poiss., vol. 11, p. 93, 1836 (type loc., Red Sea).—Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 130, 1926 (Massava Harbor, New Pommerania).

Differs from *Mugil crenilabis* and *M. heterocheilos* in larger scales (34 to 36 compared with 39 to 42). End of maxillary concealed. Lower part of upper lip with shallow groove, furnished with single row of conic papillae. Pectoral long as or longer than head. Length 230 mm. according to Weber and Beaufort.

Red Sea, Andamans, East Indies, Melanesia.

Myxus leuciscus Günther.

Myxus leuciscus Günther: Zool. Soc. London, Proc., p. 666, pl. 65, fig. A, 1871 (type loc., Rarotonga, Cook Islands).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 220, pl. 121, fig. C, 1881 (Rarotonga; Raiatea; Tahiti; Loyalty Islands).—Waite: Australian Mus., Mem., 3, p. 191, 1897 (Funafuti, Ellice Islands).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 6, no. 1, p. 15, 1906 (Makatea, Paumotus).—Fowler: B. P. Bishop Mus., Bull. 38, p. 10, 1927 (Tongareva).

Head 4; depth 3 3/4; D. IV-I, 8, 1; A. III, 8, 1; scales 47 between gill opening and caudal base with 4 larger of latter; 14 scales transversely between soft dorsal and anal origins; 30 predorsal scales; snout 3 1/10 in head; eye 4 1/8; maxillary 3 2/5; interorbital 3 2/5. Caudal peduncle well compressed, least depth 2 1/2 in head. Headth width 1 3/5 its length. Snout length 2/3 its width. No adipose eyelid. Maxillary not quite reaching eye. Lips moderately thick. Single row of fine teeth in each jaw, though upper jaw slightly longer. Interorbital broadly convex. Preorbital with hind edge finely denticulate, lower edge entire. Gill rakers 47+30?, fine, lanceolate, 1 2/3 in gill filaments which 1 1/4 in eye. Scales with 13 largely parallel basal striae; circuli very fine; 7 scales between depressed spinous dorsal tip and soft dorsal origin; soft dorsal and anal densely scaled (not shown in Günther's figure), preorbital with broad row of scales and small bordering scale each side. First dorsal spine 2 in head; pectoral fin 1 1/4; ventral 1 4/5. Dull brown above, paler below.

One in the Bishop Museum from Makatea, 196 mm.

Myxus birarae (Duncker and Mohr).

Agonostoma birarae Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 134, fig. 9, 1926 (type loc., Liebliche Islands, Mowe Harbor and Vangoi, New Pommerania).

Head 3 1/3; depth 3 1/2; D. IV-I, 7 or 8; A. II, 10 or 11; scales 32 to 34; eye 3 1/5 in head, equals snout, little below median axis in head depth, without adipose-lids; lips thin; fine teeth in both jaws. Pores above orbit and behind nostrils. Belly scales ctenoid. Anal base scaled. Small keeled scale at ventral base. First dorsal midway between snout tip and caudal base, fin short and low, less than half way to second dorsal. Anal origin midway between pectoral and caudal bases. Second dorsal origin over last third of anal base. Gold brown, lower sides yellowish white. Fins hyaline. Caudal base somewhat darker than back. Length 15 to 22 mm. (Duncker and Mohr)

Myxus trimaculatus Klunzinger.

Myxus trimaculatus Klunzinger: Zool. bot. Gesell. Wien, Verh., vol. 20, p. 832, 1870 (type loc., Red Sea).

Agonostoma trimaculatum Mohr: Zool. Jahrbücher, Jena, vol. 54, p. 201, 1927 (south coast, New Pommerania).

Depth 4 1/2 to 5 in total; D. III, 8; A. III, 9; snout 2 in head; eye 2; interorbital 1 1/2. Resembles *Myxus superficialis* Klunzinger. Teeth weak but distinct. Interorbital flatter and broader. Back gray, above with 3 whitish blotches, first at neck, second at first dorsal and third below second dorsal. Length 150 to 200 mm. (Klunzinger)

Red Sea, Melanesia.

Neomyxus chaptalii (Eydoux and Souleyet).

Mugil chaptalii Eydoux and Souleyet: Voyage "Bonite," Zool., vol. 1, p. 171, pl. 4, fig. 1, (2 figs.), 1841 (type loc., Hawaii).

Chaenomugil chaptalii Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 438, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 140, fig. 49, 1903 (1905) (Honolulu; Hilo; Kailua).—Jordan and Snyder: (U. S.) Bur. Fish., Bull., vol. 26, p. 208, 1906 (1907) (Honolulu).

Neomyxus chaptali Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 260, 1911 (Funafuti, Ellice Islands; Guam; Arhno Atoll, Marshalls; Makemo, Paumotus).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 115, 1922 (Pago Pago).

Neomyxus chaptalii Fowler: Copeia, no. 122, p. 82, Nov. 20, 1922 (Hawaii).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 11, 1925 (French Frigates Shoal, Laysan, Johnston and Lisiansky islands).—Fowler: B. P. Bishop Mus., Bull. 38, p. 10, 1927 (Palmyra, Washington, Tongareva, Baker, Christmas islands).

Myxus (Neomyxus) sclateri Steindachner: Akad. Wiss. Wien, Sitz., vol. 78, pt. 1, p. 384, 1878 (1879) (type loc., Kingsmill Islands; Hawaiian islands).

Myxus pacificus Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 500, 1901 (type loc., Laysan Island).

Chaenomugil nauticus Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 127, 1902 (1903) (type loc., Marcus Island).

Mugil cephalus (non Linné) Seale: B. P. Bishop Mus., Occ. Papers, vol. 6, no. 1, p. 17, 1906 (Nukuhiva, Marquesas Islands).

Head 4 to 4 1/5; depth 3 9/10 to 4 1/2; D. IV 1, 8; A. III, 10; scales 43 to 48 between shoulder girdle and caudal base, 13 or 14 transversely; snout 2 3/4 to 3 1/4 in head; eye 3 2/5 to 4 4/5; maxillary 3 1/8; interorbital 2 to 2 1/10.

Body robust, more compressed posteriorly. Head moderate. Snout subconic, rather pointed. Eye large, anterior. Mouth oblique, cleft deeper than long. Maxillary entirely hidden. Front part of upper lip very thick; lower edge of each lip covered with rather strong papillae or weak pectinate teeth. Lower jaw included, rather narrow. Interorbital convex. First dorsal spine 2 in head. Soft dorsal and anal slightly convex. Caudal forked, lower lobe longer and heavier. Pectoral falcate, 1 3/10 to 1 2/5 in head. Ventral truncate.

Dull olivaceous above, with silvery reflections, gradually fading into lighter and becoming white on belly. Top of head and snout brown. Operele with tinge of brown. Dorsal, caudal and pectoral dusky, last darkest, other fins pale.

In the Academy 9 from Honolulu, 33 from Hilo, 18 from Kailua, and 2 from Pago Pago. Largest 235 mm. The Bishop Museum has 5 from Honolulu, 1 Nukuhiva, 1 Laysan through W. A. Bryan in 1903 and 11 types of *Chaenomugil nauticus* from Marcus Island. One from French Frigates Shoal, 1 Laysan, 5 Johnston Island, in 1923. Two were seined in Laie Stream, Oahu, November 1922, by C. Montague Cooke, Jr. and C. Montague Cooke, III. Laysan [illegible] largest, 317 mm long. In the National Museum 1 obtained by the Wilkes Expedition at Wake Island. Also 15 specimens from the Bureau of Fisheries from Hawaii, series of young from Hilo, 22 from Makemo, 16 Mangareva, 3 Guam, 1 Funafuti. Two, introduced in California from Hawaii, Novem-

ber 1877, from B. B. Redding. Six Hawaiian specimens in the Agassiz Museum, 6 from the Society Islands through Andrew Garrett, and 6 from Mangareva.

Cestraeus plicatilis Valenciennes.

Cestraeus plicatilis Valenciennes: Hist. nat. Poiss., vol. 11, p. 116, pl. 315, 1836 (type loc., fresh waters of Celebes).—Weber and Beaufort: Nova Caledonia, Zool., vol. 2, pt. 1, p. 27, fig. 3, 1915 (Oubatche; Tao River; Ngoi River).

Agonostoma plicatile Günther: Cat. fishes Brit. Mus., vol. 3, p. 461, 1861 (Aneiteum).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 219, 1881 (New Caledonia).

Gonostomyxus loa-loa Macdonald: Zool. Soc. London, Proc., p. 38, pl. 1, 1869 (type loc., Wai Manu, tributary Rewa River, Na Viti Levu, Fiji).

Snout end blunt; no vomerine teeth; pectoral reaches 10th lateral scale, far from first dorsal origin. Reaches 452 mm.

The figure of *Gonostomyxus loa-loa* appears to have been intended for this species.

Celebes, New Caledonia, New Hebrides, Fiji.

Cestraeus goldiei (Macleay).

Aeschrichthys goldiei Macleay: Linn. Soc. New South Wales, Proc., p. 52, figs. of head, 1883 (type loc., Goldie River, New Guinea).—Macleay: op. cit., p. 270 (type).

Cestraeus goldiei Weber and Beaufort: Nova Caledonia, Zool., vol. 2, pt. 1, p. 26, fig. 2, 1915 (Timor).—Weber and Beaufort: Fishes Indo-Australian Archipelago, vol. 4, p. 262, figs. 68 and 69, 1922 (New Guinea).

Differs from *C. plicatilis* in 2 patches of vomerine teeth, snout end pointed and pectoral reaching first dorsal origin or to 12th or 13th lateral scale. Length 410 mm.

The species *Mugil broussonnetii* Valenciennes (Hist. nat. Poiss., vol. 11, p. 87, 1836, South Seas [Cook Islands]), is very imperfectly described. The original account is condensed as follows:

Head little over 5 in total; depth 4 at spinous dorsal, without caudal; D. IV-I, 9; A. III, 9; eyes masked; maxillary hidden; upper lip thick, chiefly medianly and mandibular tubercle plump, fitting in above. Scaly appendage of dorsal very pointed and greatly exceeds fin, of which first 3 spines strong and pungent; second dorsal and anal scaly; axillary scale 1/3 of pectoral, which 7 in total length. Caudal little forked. Back gray, sides silvery, below white.

Other names given are: *Mugil communis* (Solander) Valenciennes, op. cit., (name in text); *Mugil lavarctoides* (Solander) Valenciennes, op. cit. (name in text); *Mugil strigatus* (Solander) Valenciennes, op. cit. (name in text).

Described as *Mugil broussoneti* by Duncker and Mohr (Zool. Mus. Hamburg, Mitt., vol. 42, p. 131, 1926, Mowe and Luschan harbors and Rein Bay, New Pommerania) as follows:

D. IV-I, 10; A. III, 9 or 10; scales 36 to 38. Adipose eyelid little developed. Maxillary scarcely visible. Upper lip little thickened. Dorsal and paired fins with small keeled scales; dorsal and anal bases scaled. First dorsal inserted between snout tip and caudal base; second dorsal inserted little behind anal origin. Body dark brown above, contrasted belly pale. Second dorsal and caudal blackish, bases darker. First dorsal, anal and pectoral with rays very little pigmented. Ventral hyaline. Length 30 to 45 mm.

The *Mugil perusii* Valenciennes (Hist. nat. Poiss., vol. 11, p. 86, 1836, Vanicolo) is another imperfectly described species which has not subsequently been discovered. Its description condensed is as follows:

Depth 4 1/2 in total; D. IV-I, 8; A. III, 8. Body robust. Head less broad than in *Mugil cephalus*. Eyes with thick lips. Upper lip thick, without teeth or cilia, appears obliquely truncated below snout. Axillary pectoral scale long and pointed. Soft dorsal and anal scaly. Caudal emarginate. Pectoral shorter than head. Uniform silvery with golden reflections, but without longitudinal brown lines. Pectoral blackish. Length 161 mm.

In many ways it suggests *Mguil ouer* but differs in the scaly soft dorsal and anal, also the dark pectoral.

East Indies.

SPHYRAENIDAE

Sphyraena barracuda (Walbaum).

Esox barracuda Walbum: Arted Pisciium, pt. 3, p. 94, 1792 (on *Barracuda* Catesby, Nat. hist. Carolina, vol. 2, p. 1, pl. 1771, type loc., Bahamas).

Sphyraena commersonii Schmeltz: Mus. Godeffroy, Cat. 4, p. 17, 1869 (Viti Islands).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., pp. 501, 520, 1900 (Hawaii, Tahiti).—Snyder: U. S. Fish Comm., Bull., vol. 22, p. 523, 1902 (1904) (Honolulu).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 109, 1913 (Saonek, Waigiu).—Fowler: Copeia, no. 122, p. 82, Nov. 20, 1922 (Hawaii).

Sphyraena commersoni Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 438, 1902 (1903) (Honolulu).

Sphyraena snodgrassi Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 388, fig. 2, 1899 (1901) (type loc., Honolulu).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 749, 1903 (Honolulu; Tahiti).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 142, fig. 52, 1903 (1905) (Honolulu; Waialua).—Jordan and Snyder: (U. S.) Bur. Fish., Bull., vol. 26, p. 208, 1906 (1907) (Honolulu).

Sphyraena agam (non Rüppell) Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 500, 1901 (Honolulu).

Sphyraena picuda Fowler: B. P. Bishop Mus., Bull. 22, p. 7, 1925 (Guam).—Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 130, 1926 (Liebliche Island, New Pommerania; New Mecklenburg; Bird Island Bay, Admiralty Islands; Dörperspitze and northeast coast, New Guinea).

Head 3 1/4; depth 6 1/2; D. V-I, 9; A. I, 9; scales 89 in lateral line to caudal base; 11 scales above lateral line, 9 below; snout 2 1/10 in head from its own tip; eye 7 1/3; maxillary 2 1/5; interorbital 4 2/3.

Body and head regularly fusiform. Eye slightly ovate, larger anteriorly. Lower jaw projects beyond upper 2/3 pupil diameter, blunt tip not ending in fleshy appendage. Maxillary reaches front of eye. Each side of upper jaw with 2 long sharp canines forward and 5 or 6 nearly as large, but broader teeth, gradually smaller posteriorly. Mandible with 2 large anterior median teeth, similar to front upper teeth and posteriorly single series of about 15 smaller teeth in each jaw. Interorbital flat, width equals nearly twice vertical eye diameter. Opercle spineless, with 1 or 2 blunt flexible points. Suborbital scaled; 18 rows of vertical scales from eye to preorbital edge and 8 rows on opercle, those of latter enlarged, rest of head naked. Lateral line slightly slopes till midway along side before second dorsal. Second dorsal spine 3 1/10 in total head, third subequal; first branched dorsal ray 2 1/2. Anal origin slightly behind soft dorsal

orgin, first branched ray 2 2/5. Caudal forked, lobes equal. Pectoral 2 9/10 in head; ventral 3 1/5.

In the National Museum the type of *Sphyraena snodgrassi* examined, also 2 specimens from New Guinea, both small, and small Hawaiian specimen from the Bureau of Fisheries. In the Honolulu markets I examined over 660 specimens in 1922 and a few in January 1923. The largest were about 912 mm. long. The head of one measured over 300 mm. Two heads, 228 and 241 mm. long, in the Agassiz Museum, were obtained by Andrew Garrett in the Society Islands. In the smaller the maxillary reaches the eye, in the larger slightly beyond. Also an Hawaiian specimen 404 mm. The Academy has 6 from Honolulu, 1 from Hilo, 1 from Waialua, 1 from Tahiti.

Easily known by its large scales and large size, reaching 1800 mm.

Indo-Pacific from the Red Sea and Madagascar to Hawai, West Atlantic from Brazil to the West Indies, Florida and Bermuda.

Sphyraena forsteri Cuvier.

Sphyraena forsteri Cuvier: Hist. nat. Poiss., vol. 3, p. 261, 1829 (type loc., Tahiti).—Valenciennes: op. cit., vol. 7, p. 382, 1831 (New Guinea; Tahiti).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 211, pl. 119, fig. A, 1877 (Tahiti).—Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 280, 1876 (Hall Sound, New Guinea).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 38, 1878 (New Guinea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 5, pt. 2, p. 33, 1881 (south coast of New Guinea).—Macleay: op. cit., vol. 7, p. 361, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 269, 1883 (Hood Bay, New Guinea).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 219, 1905 (1906) (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 262, 1911 (Suva, Fiji).

Sphyraena goodingi Seale: B. P. Bishop Mus., Occ. Papers, vol. 6, no. 1, p. 18, fig. 4, 1906 (type loc., Nukuhiva, Marquesas Islands).

Head 3; depth 7 1/4; D. V-I, 1, 8, 1; A. III, 1, 6, 1; P. 1, 12; V. I, 5; scales (pockets) 117 between gill opening and caudal base and 8 more on latter; 15 scales above lateral line to soft dorsal origin, 16 below to soft anal origin; 45 predorsal scales; 19 scales behind eye to preopercle ridge; mandible 1 2/3 in head; head width 3 1/6; second dorsal spine 3 7/8; first branched dorsal ray 4; first branched anal ray 4 1/6; least depth of caudal peduncle 5; pectoral 3; ventral 3 3/4; snout 2 1/8 in head measured from upper jaw tip; eye 5; maxillary 2 1/6; interorbital 4 1/2. Gill rakers about 15 low tubercles, denticulated, on lower limb of first gill arch; denticles 1 or more to each tubercle, short and uniform; other tubercles little marked and fairly smooth. Scales mostly fallen, marginal basal radiating striae very numerous, about 82 complete. Back dull purplish-brown, sides and below paler. Fins brown, dorsals, anal, pectoral and caudal with dusky tinge. Iris dull slaty.

In the Bishop Museum, the type of *Sphyraena goodingi*, described above, 532 mm. long, and one from Tahiti, 436 mm. long, obtained by Alvin Seale in February 1901. In the National Museum 1 from Samoa and 1 from Suva.

Agrees with *Sphyraena barracuda* in the rounded preopercle, but the scales smaller and the lower teeth inclined backward.

India, East Indies, Formosa, Tahiti.

Sphyraena jello Cuvier.

Sphyraena jello Cuvier: Hist. nat. Poiss., vol. 3, p. 258, 1829 (type loc., Vizagapatam). (On *Jellow* Russell: Fishes of Coromandel, vol. 2, p. 59, pl. 174, 1803, Vizagapatam.)

Sphyroena kadanar Thiollière: Fauna Woodlark, p. 149, 1857 (type loc., Woodlark Island).

Lucioperca ? kadanar (Montrouzier) Thiollière: Fauna Woodlark, p. 149, 1857 (name in synonymy).

Included on the account by Jouan (Soc. Cherbourg, Mem., vol. 8, p. 302, 1861, Kanala, New Caledonia) condensed as follows:

Body elongate, little rounded. Head slender, grooved above longitudinally. Snout conic, oblong. Eyes large, behind mouth. Mandible protruding. Jaws with pointed, irregular teeth, anterior stronger. Gill opening large. Lateral line distinct. First dorsal slender, begins little nearer head than caudal, which small and second spine longest. Second dorsal nearer first than caudal, first ray equals last and third longest. Pectoral small. Ventral before first dorsal, midway in pectoral. Blue on back, belly silvery. Vertical bands, more colored above, encompass the body, forming angle at lateral line and turned toward head. Length 700 mm.

Jouan also mentions a smaller *Sphyraena,* 200 mm. long, with silvery longitudinal band, reflected blue, along the side. Possibly it may refer to *Sphyraena obtusata.* Possibly the reference to *Sphyraena novae-hollandiae* Schmeltz (Mus. Godeffroy, Cat. 4, p. 17, 1869, Kandavu), may refer to this species.

Ranges from South and East Africa to the East Indies, China, and New Caledonia.

Sphyraena qenie Klunzinger.

Sphyraena qenie Klunzinger: Zool. Bot. Ges. Wien, Verh., vol. 20, p. 823, 1870 (type loc., Red Sea).

Sphyraena genie Peters: Akad. Wiss. Berlin, Monatsb., p. 842, 1876 (1877) (Bougainville Islands).

Differs from *Sphyraena jello* in the vertically erect teeth, pectoral reaching little beyond first dorsal and all fins dark.

Klunzinger later changes this name to *Sphyraena kenie* (Fische Rothen Meeres, pt. 1, p. 129, pl. 9, fig. 2-2a 1884).

Sphyraena japonica Cuvier.

Sphyraena japonica Cuvier: Hist. nat. Poiss., vol. 3, p. 261, 1829 (type loc., Japan).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 11, 1925 (Johnston Island).

Sphyraena helleri Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 387, fig. 1, 1899 (1901) (type loc., Honolulu).—Jenkins: op. cit., vol. 22, p. 438, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 143, fig. 51, 1903 (1905) (Honolulu, Hilo).—Jordan and Snyder: (U. S.) Bur. Fish., Bull., vol. 26, p. 208, 1906 (1907) (Honolulu).—Fowler: Copeia, no. 112, p. 82, Nov. 20, 1922 (Hawaii).

Sphyraena vulgaris (non Cuvier) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 19, 1902 (Honolulu).

Head 2 3/4; depth 8 1/5; D. V-I, 8, 1; A. I, 8, 1; scales 125 + 8 in lateral line; snout 2 1/10 in head from snout tip; eye 7 1/4, 3 2/3 in snout; maxillary

2 2/5 in head; interorbital 4 3/4. Pectoral 1 1/3 to first dorsal origin, which opposite ventral origin; in smaller example pectoral 1 3/5 to first dorsal.

The Bishop Museum has 2 from Honolulu, larger 838 mm. long. Also 3 from Johnston Island, obtained in 1923. Examined 196 in the Honolulu markets in December 1922. Two in the National Museum from Maui, 1 from fresh water, obtained by the Wilkes Expedition. Also the type of *Sphyraena helleri*. One Hawaiian specimen in the Academy, 591 mm.

This species, *S. langsar,* and *S. obtusata* have a rectangular preopercle. *S. japonica* is distinguished by its smaller scales and the dorsal inserted a little before the ventrals.

Natal, Celebes, Formosa, Japan, Hawaii.

Sphyraena langsar Bleeker.

Sphyraena langsar Bleeker: Nat. Tijds. Ned. Ind., vol. 7, p. 367, 1854 (type loc., Batjan).

Sphyraena megalolepis Peters: Akad. Wiss. Berlin, Monatsb., p. 842, 1876 (1877) (type loc., Cartaret Harbor, New Ireland).

Eye 4 3/4 to 5 in head from snout tip, 2 1/8 to 2 1/6 in snout. Depth 6 1/2 to 7 3/5. Preopercle angle rectangular. First dorsal origin well behind ventral origin or behind vertical through tip of depressed pectoral. Scales 78 + 9 in lateral line. Length 146 to 260 mm.

The National Museum has 3 from New Guinea, also 1 from Fiji, obtained by the Wilkes Expedition.

Sphyraena megalolepis has but 5 or 6 scales above the lateral line and evidently is a synonym of *S. langsar*. Both *S. langsar* and *S. obtusata* have less than 90 scales.

Ceylon, East Indies, Formosa, North Australia, Fiji.

Sphyraena obtusata Cuvier.

Sphyraena obtusata Cuvier: Hist. nat. Poiss., vol. 3, p. 258, 1829 (type loc., Pondicherry; Bourbon Island; Malabar; Port Jackson).—Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 212, pl. 119, fig. B, 1877 (Fiji).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 361, 1882 (New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 66, 1900 (1901) (Guam).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 218, 1905 (1906) (Apia).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 6, no. 1, p. 18, 1906 (Faté).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 261, 1911 (Moen, Truk Group, Carolines; Suva, Fiji).

Sphyraena forsteri (non Cuvier) Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 219, 1905 (1906) (Apia; part).

Three in the Bishop Museum from Faté, largest 143 mm. and 3 from Guam. In the National Museum 1 from Suva and 1 from Moen. In the Agassiz Museum 1 from the Society Islands, 100 mm. long, received from Andrew Garrett.

Sphyraena pinguis Günther is evidently the same. Distinguished from *Sphyraena langsar* by the spinous dorsal origin above or slightly behind tip of depressed pectoral.

Indo-Pacific from East Africa to East Indies, Australia, New Zealand, Samoa.

POLYNEMIDAE

Polydactylus plebeius (Bonnaterre).

Polinemus plebeius Bonnaterre: Tableau ichth., p. 183, pl. 74, fig. 309, 1788 (type loc., South Sea).

Polynemus plebeius Cuvier: Hist. nat. Poiss., vol. 3, p. 281, 1829 (Tahiti; Tanna).—Thiollière: Fauna Woodlark, p. 150, 1857 (Woodlark Island).—Peters: Akad. Wiss. Berlin, Monatsb., p. 835, 1876 (1877) (New Britain).

Polynemus plebejus Günther: Mus. Godeffroy, Jour., vol. 4, p. 103, pl. 77, fig. A, 1875 (Guadalcana, Solomons; Samoa; Tahiti).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 14, 1877 (Upolu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 4, p. 63, 1879 (Solomons).—Macleay: op. cit., vol. 7, p. 353, 1882 (New Guinea).—Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 129, 1926 (Rein Bay, Lagoon Point, Luschan and Mowe harbors, New Pommerania).

Polydactylus plebejus Steindachner: Akad. Wiss. Wien., Sitz., vol. 115, pt. 1, p. 1417, 1906 (Upolu).

Polydactylus plebeius Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 18, 1906 (Tahiti; Nukuhiva, Marquesas).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 219, 1905 (1906) (Apia; Pago Pago).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 607, 1908 (Suva, Fiji).

Polynemus tetradactylus Cuvier: Hist. nat. Poiss., vol. 3, p. 277, 1829 (Tahiti).

Trigla asiatica (Forster) Lichtenstein: Descriptiones animalium, Forster, p. 236, 1844 (Tahiti; Huahine; Oriadea).

Pogonias? barakuan (Montrouzier) Thiollière: Fauna Woodlark, p. 150, 1857 (name in synonymy).

Polynemus lineatus Günther: Cat. fishes Brit. Mus., vol. 2, p. 327, 1860 (Guatalcana).

Polynemus taeniatus Günther: Cat. fishes Brit. Mus., vol. 2, p. 526, 1860 (name only).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 17, 1869 (Samoa).

Head 3 1/8; depth 3 2/5; D. VIII-I, 13, 1; A. II, 11, 1; scales 65 in lateral line to caudal base and 15 more on latter; 8 scales above lateral line, 12 below; 31 predorsal scales; snout 4 4/5 in head; eye 4 2/5; maxillary 1 3/5; interorbital 3 4/5. Least depth of caudal peduncle 2 2/5 in head. Head width 1 7/8 in its length. Snout conic, length 4/5 its width. Maxillary extends beyond eye about 2/3 eye diameter; expansion 2 in eye. Interorbital convexly elevated. Gill rakers 11 + 14, 111, lanceolate, 1 1/2 in eye; gill filaments 1 2/5 in gill rakers. Scales with 2 or 3 basal radiating striae, one forming median notch; apical denticles 65 to 92, basal elements in 9 or 10 series; circuli fine. Third dorsal spine 1 2/5 in head; first branched dorsal ray 1 2/5; second anal spine 3 1/2; first branched anal ray 1 3/4; pectoral little longer than head; ventral 1 1/2. Pectoral filaments 5. Uniform dark brown. Length 295 mm.

In the Bishop Museum 1 from Tahiti and 3 from Nukuhiva, 75 to 78 mm. The National Museum contains 2 from New Guinea, larger 338 mm. long and 2 adults from Samoa.

East Africa to India, East Indies, Formosa, Australia and Tahiti.

Polydactylus microstomus (Bleeker).

Polynemus microstoma Bleeker: Nat. Tijds. Ned. Ind., vol. 2, p. 217, 1851 (type loc., Bulucomba).

Trichidion microstoma Bleeker: Arch. Neerl. Sc. Nat., vol. 13, p. (38) 64, pl. 2, fig. 5, 1878 (New Guinea).

Like the preceding with 5 free pectoral filaments. Like the following in having only 2 or 3 simple rays in the pectoral, though differs in larger scales, 47 to 50. Length 250 mm.

East Indian Region.

Polydactylus indicus (Shaw).

Polynemus indicus Shaw: Gen. Zool., vol. 5, pt. 1, p. 155, 1804 (type loc., Indian Seas). (On *Maga Booshee* Russell: Fishes of Coromandel, vol. 2, p. 68, pl. 184, 1803: type loc., Vizagapatam.)

Trichidion indicum Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).

Scales smaller than in both *P. microstomus* and *P. plebeius*, or 70 to 75. Reaches 1220 mm.

Mauritius, Madagascar, India, East Indies, Australia.

Polydactylus sexfilis (Valenciennes) (Pl. VII, *B*).

Polynemus sexfilis Valenciennes: Hist. nat. Poiss., vol. 7, p. 387, 1831 (type loc., Mauritius).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 104, 1875 (Pelew Islands; Society Islands).—Günther: Rept. voyage "Challenger," vol. 1, p. 59, 1880 (Hilo, Hawaii).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 492, 1901 (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 30, December, 1922 (Honolulu).

Polydactylus sexfilis Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 67, 1900 (1901) (Guam).—Seale: op. cit., vol. 1, no. 5, pp. 15, 16, 1902 (Hilo, Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 439, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 523, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 144, 1903 (1905) (Honolulu; Hilo).—Fowler: Copeia, no. 112, p. 82, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 7, 25, 1925 (Guam; Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 11, 1925 (Laysan, Lisiansky Island and French Frigates Shoal).

Trichidion kuru Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).

Polynemus kuru Smith and Swain: U. S. Nat. Mus., Proc., p. 122, 1882 (Johnston Island).

Polydactylus kuru Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 263, 1911 (Nukuhiva, Marquesas Islands).

Polynemus approximans (non Bennett) Schmeltz: Mus. Godeffroy, Cat. 6, p. 14, 1877 (South Sea).

Polydactylus pfeifferi (non Bleeker) Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 501, 1900 (Hawaiian islands).

Head 3 1/5 to 3 2/5; depth 3 1/5 to 3 2/5; D. VIII-I, 12, 1 or 13, 1; A. III, 11, 1 or 12, 1; P. 1, 15, 6; V. I, 5; tubular scales 60 to 66 in lateral line to caudal base and 15 to 20 more out over caudal basally; 8 or 9? scales above lateral line, 12 or 13 below, 28 to 35? predorsal; snout 5 to 6 in head; eye 3 2/5 to 3 2/3; maxillary measured from its own tip, 2 to 2 1/10; interorbital 3 1/5 to 3 1/2.

Body elongately ovoid, well compressed, deepest at soft dorsal origin. Caudal peduncle strongly compressed, least depth half its length or 2 1/6 to 2 1/5 in head. Head width 2 1/4 to 2 2/5 in its length. Snout obtusely conic, length 3/4 its width. Eye large, hind edge slightly before middle in head length; eye much greater than snout, nearly or quite equals interorbital; adipose tissue broadly covers eye. Mouth moderate, inferior, symphysis opposite front eye edge. Maxillary reaches well beyond eye, about 2/3 in head; expansion 2 1/4 to 2 1/2 in eye. Teeth villiform, fine, in narrow bands in jaws, on vomer and palatines. Nostrils similar, together, about median in snout laterally. Interorbital broadly convex. Hind preopercle edge finely serrate and small denticle above angle. Gill rakers 12 to 14 + 16 or 17, lanceolate, 1 2/5 to 1 1/2 in eye; gill filaments 2/5 of gill rakers. Scales with 4 or 5 basal radiating striae, edge with median notch; apical denticles in 38 to 55 series, transversely 4 to 6; circuli fine. Lateral line slopes down from shoulder until median along side. Third dorsal spine 1 2/5 to 1 1/2 in head; first branched dorsal ray 1 1/10 to 1 1/4; third anal spine 3 to 3 1/4; first branched anal ray 1 1/6 to 1 2/3; pectoral fin 1 1/5 to 1 1/2, filaments reach vent; ventral 1 1/2 to 1 2/3; caudal strongly forked, 2 1/4 to 2 2/5 in combined head and trunk.

Back pale drab-gray, becoming slightly yellow on sides, below whitish. Dorsals dusky terminally, darker on spinous fin. Caudal, anal and pectoral brownish terminally, lower anal edge whitish. Ventral whitish. Iris silver-white. Length 115 to 324 mm.

In the Agassiz Museum 7 from Nukuhiva, Marquesas Islands, obtained by the *Albatross*, 1 from Society Islands 177 mm. long, with 5 pectoral filaments, through Andrew Garrett, also 4 Hawaiian specimens from Society Islands. The Bishop Museum contains 1 from Guam, 7 from Honolulu, 1 from Moiliili on Oahu, 1 from Hilo, in 1923; 15 Laysan, 1 Lisiansky, 1 French Frigates Shoal. I examined 271 specimens in the Honolulu markets during November and December 1922. One from Koko Head, Oahu, February 7, 1921 from N. G. Smitt, a mutilated specimen in which the entire caudal peduncle and caudal fin have been removed, the body healing. Small specimen from Laie, Oahu, in 1916 and 21 young from the same place November 5, 1922, by C. Montague Cooke, III. Most of the young in life bright silvery-white, back and upper fins a little grayish. After placed in alcohol a week or more the 3 dark transverse bands or blotches begin to appear. Some also found on the Island Mokuauia, in rock pools and in the estuary of Laie Stream, where they were seined with *Caranx, Sicyopterus* and *Kuhlia*. They are among the first fish to die. Four Hawaiian specimens in the Academy. The National Museum has 2 from Oahu obtained by the Wilkes Expedition. Also 4 from the Bonin Islands through William Stimpson, 5 Hawaiian specimens through the Bureau of Fisheries, 16 from Nukuhiva and 1 from Johnston Island.

Though Jordan and Evermann give but 7 dorsal spines, all my specimens show 8.

Mauritius to East Indies and Hawaii.

Polydactylus heptadactylus (Cuvier).

Polynemus heptadactylus Cuvier: Hist. nat. Poiss., vol. 3, p. 288, 1829 (type loc., Batavia, Java).—Duncker and Mohr: Zool. Mus. Hamburg, Mitt., vol. 42, p. 130, 1926 (Rein Bay, New Pommerania).

Pectoral with 7 free filaments, reaching depressed ventral ends or slightly further; fin shorter than head. Brown above, silvery below. Fins mostly yellow, pec-

toral black. Reaches 150 mm. according to Weber and Beaufort.

India, Ceylon, East Indies, Melanesia.

SCOMBRIDAE

Scomber japonicus Houttuyn (Pl. VII, *C*).

Scomber japonicus Houttuyn: Hollandsche Maatsch. Wet. Haarlem, Verh., vol. 20, p. 331, 1792 (type loc., Japan).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 169, 1903 (1905) (Hilo, Honolulu).

Pneumatophorus japonicus Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 31, December, 1922 (rather rare about Hawaii).

Scomber uam Thiollière: Fauna Woodlark, p. 171, 1857 (type loc., Woodlark Island).

In the National Museum 2 "probably Pacific" and 4 Mangsi Island, obtained by the Wilkes Expedition. Length 63 to 230 mm. The smallest shows but 9+17 gill rakers. Also 2 Hawaiian adults through the Bureau of Fisheries. Two in the Bishop Museum from Honolulu, 323 and 431 mm. I examined 106 specimens in the Honolulu markets during November and December 1922.

Jouan identifies a *Scomber* (Soc. Nat. Cherbourg, Mem., vol. 8, p. 292, 1901, Kanala, Port de France, New Caledonia) with *Scomber uam*, which he notes as follows:

More elongate than our mackerel. Head large, pointed, flattened. Mouth well cleft, oblique. Jaws toothless, nearly equal. Gill opening very large. Lateral line straight. Finlets 5. Caudal very forked. Pectoral and ventral small. Head black above. Back sea-green, with black points. Longitudinal blackish lines, low on back and upon flanks elevated. Abdomen and flanks silvery. Length 220 mm.

Scomber kanagurta Rüppell.

Scomber kanagurta (Cuvier) Rüppell: Atlas Reis. Nordl. Afrika, Fisch., p. 93, 1828 (type loc., Gomfuda, Red Sea).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 149, 1876 (Pelew Islands and Fiji).

Scomber loo Lesson: Dict. classique hist. nat., vol. 15, p. 277, 1829 (type loc., Port Praslin, New Ireland).—Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 166, pl. 33, 1830 (New Ireland and Waigiu).—Cuvier: Hist. nat. Poiss., vol. 8, p. 38, 1831 (Praslin, Waigiu, Dorey Harbor, New Guinea).—Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 359, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 266, 1883 (Pitt Bay, Moresby Island, New Guinea).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 228, 1905 (1906) (Apia).

Scomber microlepidotus Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 27, 1885 (Rubi, New Guinea).

Scomber chrysozonus Peters: Akad. Wiss. Berlin, Monatsb., p. 836, 1876 (1877) (Bougainville Island).

Distinguished from *Rastrelliger brachysoma* by the fewer gill rakers, which number 13 + 23 to 30.

Two adults in the National Museum from Samoa. I follow Günther in retaining *Scomber loo* with *Scomber kanagurta*.

Widely distributed in the Indo-Pacific region.

Rastrelliger brachysoma (Bleeker).

Scomber brachysoma Bleeker: Nat. Tijds. Ned. Ind., vol. 1, p. 356, 1850 (type loc., Batavia, Java).

Rastrelliger brachysoma Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 609, fig. 3, 1908 (Suva, Fiji).

Scomber microlepidotus (non Rüppell) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 30, 1906 (Shortland Island; Faté).

Head 2 1/2; depth 3 3/4; D. IX-III, 10-5; A. II, 10-5; scales 120 in lateral line to caudal base and 10 more on latter; 9 scales above lateral line, 21 below; 23 predorsal scales; snout 2 in head; eye 3 7/8; maxillary 1 7/8; interorbital 3 1/2. Least depth of caudal peduncle 1 3/4 in eye. Head width half its length. Snout conic, long as wide. Eye with broad adipose lid, largely concealing eye. Maxillary largely concealed, not quite reaching opposite hind eye edge. Lower jaw scarcely projects. Teeth in jaws very minute, uniserial, none on palate. Interorbital slightly convex. Gill rakers 21 + 45, lanceolate, inner edges with fine striae, much longer than gill filaments or 3 in head. Scales with 76 vertical parallel striae; apical edge with finely cutaneous ragged margin. Second dorsal spine 2 in head; first branched dorsal ray 3 2/3; first branched anal ray 3 4/5; lower caudal lobe 1 2/5; pectoral 2; ventral 2 1/4. Dull brown, paler to whitish below and on sides.

Two from Shortland Island, 254 mm. and 280 mm. and 2 from Faté, New Hebrides, 146 and 152 mm., in the Bishop Museum.

Widely distributed in the Indo-Pacific.

Scomberomorus commerson (Lacépède).

Scomber commerson Lacépède: Hist. nat. Poiss., vol. 2, pp. 598, 600, pl. 20, fig. 1, 1800 (no type locality).

Scomber commersoni Schneider: Systema ichth., Bloch, p. 545, 1801 (South Sea).

Cybium commersonii Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 266, 1883 (Hood Bay, New Guinea).

Scomberomorus commersonii Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 610, 1908 (Suva, Fiji).

Teeth triangular, minutely serrated. Gill rakers 1 + 3.

Indo-Pacific, from the east coast of Africa to the East Indies and Fiji.

Auxis thazard (Lacépède).

Scomber thazard Lacépède: Hist. nat. Poiss., vol. 3, p. 9, 1802 (type loc., between 6° and 7° S. Lat. on coast of New Guinea).

Auxis thazard Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 441, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 171, 1903 (1905) (Hilo; Honolulu).

Scomber taso (Commerson) Cuvier: Hist. nat. Poiss., vol. 8, p. 106, 1831 (type loc., New Guinea, 6°-° S. Lat.).

Head 3 2/5; depth 4; D. X-III, 9, 1-8; A. III, 11, 1-7; head width 2 in its length; first dorsal spine 2; pectoral 2; ventral 2 3/4; least depth of caudal peduncle 2 in eye; snout 4 in head; eye 5 4/5; maxillary 3 1/10; interorbital 3 2/3.

One in the Bishop Museum, from Honolulu, 392 mm. long. I found a small specimen in the Honolulu market November 4, 1922, and 12, each about 304 mm. long, on December 27. Adult from Honolulu in the National Museum.

Circumtropical.

Euthynnus pelamis (Linné).

Scomber pelamis Linné: Systema nat., 10th ed., p. 297, 1758 (type loc., Pelagic between tropics).

Thynnus pelamys Cuvier: Hist. nat. Poiss., vol. 8, p.

82, pl. 214, 1831 (Tahiti; Dangerous Archipelago).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 151, 1876 (Pacific Ocean).

Scomber pelamys F. D. Bennett: Narrative whaling voyage, p. 278, 1840 (Pacific Ocean).

Gymnosarda pelamis Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 441, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 172, 1903 (1905) (Honolulu; Hilo).—Kishinouye: College Agriculture, Tokyo, Jour., vol. 2, p. 383, 1911 (Bonin Islands).

Euthynnus pelamis Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 31, December, 1922 (Honolulu).

Thynnus vagans Lesson: Dict. classique hist. nat. Paris, vol. 15, p. 279, 1829 (type loc., Tahiti).—Lesson: Voyage "Coquille," Poiss., p. 162, pl. 32, 1830 (Tahiti).

Head 2 7/8; depth 3 3/5; D. XV-IV, 13, 1-8; A. IV, 13, 1; head width 1 3/4 in its length; snout 3 1/8; eye 7 3/4; maxillary 2 2/3; interorbital 3 1/8.

Readily distinguished by the 4 longitudinal stripes on the side of the body below the lateral line.

Two in the Bishop Museum from Honolulu, 507 and 654 mm. long. I examined 586 specimens in the Honolulu markets in November and December 1922 and January 1923. C. Montague Cooke reports one school, several years ago, off the north coast of Oahu, about 90 miles long and 10 miles broad. Individuals of similar size assembled in certain parts of the school.

Lesson's figure shows the maxilary not reaching the eye.

Circumtropical.

Euthynnus alletteratus (Rafinesque) (Pl. IX, *A*).

Scomber alletteratus Rafinesque: Car. An. Sicil., p. 46, pl. 2, fig. 2, 1810 (type loc., Sicily).

Gymnosarda alletterata Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 441, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 173, 1903 (1905) (Hilo; Honolulu).

Euthynnus alletteratus Fowler: Copeia, no. 112, p. 82, Nov. 20, 1922 (Hawaii).—Fowler and Ball: B. P. Mus., Bull. 26, p. 11, 1925 (off Laysan).

Euthynnus alleteratus Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 31, December, 1922 (Hilo).

Thynnus thunnina Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 150, pl. 95, 1876 (Society Islands).—Günther: Rept. voyage "Challenger," vol. 31, pt. 2, p. 17, pl. 2, fig. D, 1888 (1889) (Admiralty Islands to Japan).

Pelamys affine Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 761, 1904 (Honolulu).

Head 3 2/3; depth 3 4/5; D. XV-II, 10, 1-8; A. III, 11-7; snout 3 1/6 in head measured from upper jaw tip; eye 6 1/2; maxillary 2 1/2; interorbital 2 4/5; head width 1 5/6 its total length; upper caudal lobe 1 2/3; least depth of caudal peduncle 2 in eye. Snout conic, length 4/5 its width. Eye 1 3/4 in snout. Maxillary extends slightly beyond eye center. First dorsal spine 1 9/10 in head; first branched dorsal ray 4 1/3; first branched anal ray 4 1/3; pectoral 1 3/4; ventral 2 1/5. Gill rakers 9 + 22, lanceolate, 1 1/2 in gill filaments or equal eye. Head and corselet brownish. Back dark gray, with 13 or 14 dark waved slaty streaks, faintly below lateral line. Fins all brownish.

One in the Bishop Museum from Honolulu 481 mm. long. In the Honolulu markets I examined 220 specimens during November and December 1922 and a few in January, 1923. Half-grown specimen in the National Museum from Hawaii. One in the Academy from Honolulu.

Circumtropical.

Thunnus thynnus (Linné).

Scomber thynnus Linné: Systema nat., 10th ed., p. 297, 1758 (type loc., Pelagic between Tropics).

Thynnus thynnus Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 150, 1876 (probably South Sea).

Thunnus thynnus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 376, 1923 (Honolulu).

Thunnus orientalis Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 32, December, 1922 (Honolulu).—Jordan and Evermann: Cal. Acad. Sci., Occ. Papers, vol. 12, p. 14, Sept. 30, 1926.

Cast of a specimen 1342 mm. long, from Honolulu, in the Bishop Museum. It shows the corselet indistinct; maxillary reaching to eye; pectoral long as head, nearly reaching soft dorsal; eye 3 in snout; back slaty, strongly contrasted with grayish lower surface. It is close to the figure of *Albacora thynnus* by Dresslar and Feslar (U. S. Fish Comm., Bull., vol. 7, p. 439, pl. 7, 1887 [1889]) from Martha's Vineyard.

I examined 12 small specimens in the Honolulu markets as: 2, November 18, 1922; 2 December 13; 3, December 14, and 5, December 15. One in Agassiz Museum from the Society Islands, 355 mm. long. It shows: maxillary about first 2/5 in eye; eye 1 3/4 in snout; pectoral over half of head; corselet apparently distinct, though this may be due in part to the preservation; back with dark blotches about size of pupil, apparently somewhat inclined.

I cannot find that *Thynnus orientalis* Schlegel is different.

Pelagic and circumtropical.

Germo alalunga (Gmelin).

Scomber alatunga Gmelin: Systema nat. Linn., vol. 1, p. 1330, 1789 (type loc., Mediterranean).

Germo alalunga Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 33, Dec., 1922 (Honolulu).

Scomber germo (Commerson) Lacépède: Hist. nat. Poiss., vol. 3, p. 1, 1802 (Pacific Ocean).—(Lat. S. 27°, Long. 103°).—F. D. Bennett: Narrative whaling voyage, p. 278, 1840 (Pacific Ocean).—Jouan: Soc. Cherbourg, Mem., vol. 8, p. 292, 1861 (Port-de-France, New Caledonia).

Scomber germon Lacépède: Hist. nat. Poiss., vol. 2, p. 598, 1800 (no type locality).

Thynnus pacificus Cuvier: Hist. nat. Poiss., vol. 8, p. 96, 1831 (type loc., Pacific Ocean, S. Lat. 26°-27°, Long. 103°).

Distinguished by the very long pectoral. Finlets all dark, without any yellow.

Cast of specimen from Honolulu in the Bishop Museum, 1083 mm. long. Head and part of trunk still preserved, showing: snout 3 1/10 in head; eye 5 4/5; maxillary 2 3/4; interorbital 4; pectoral fin 457 mm. long. Sev-

eral hundred brought in the markets at times. The above specimen average size.

Circumtropical.

Germo sibi (Schlegel) (fig. 28).

Thynnus sibi Schlegel: Fauna. Japonica, Poiss., pts. 5-6, p. 97, pl. 50, 1844 (type loc., Japan).

Germo sibi Snyder: U. S. Fish Comm., Bull., vol. 22, p. 523, 1902 (1904) (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 33, December, 1922 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 38, p. 10, fig. 1, 1927 (Fanning Island).

Thynnus germo (non Lacépède) Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 151, pl. 96, 1876 (Ohitirboa Island).

Germo argentivittatus Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 33, Dec., 1922 (Honolulu).

Kishinoella zacalles Jordan and Evermann: California Acad. Sci., Occ. Papers, vol. 12, p. 27, pl. 7, Sept. 30, 1926 (type loc., Honolulu market, photograph).

Germo allisoni Nichols: Am. Mus. Novit., no. 94, p. 3, Oct. 9, 1923 (Christmas Island).

Head 3 3/5; depth 4 1/2; D. spines 13; snout 3 in head; eye 7 1/4; maxillary 2 1/2; mandible 6 1/3, from lower jaw tip. Pectoral tip reaches soft dorsal origin. Spinous dorsal slightly behind that of pectoral. Lobe of soft dorsal reaches slightly over half way to caudal base. Anal origin slightly behind soft dorsal origin, long lobe 1 1/3 to caudal base. Both caudal lobes long as soft dorsal lobe. Caudal peduncle with strong keel each side. Ventral 2 1/5 in head, from upper jaw tip. A very large species with bright yellow finlets.

The above described from a cast made by J. W. Thompson, taken at Kaena Point, Oahu, August 3, 1922. Weight 113 lbs., length 1583 mm. One taken in late August weighed 128 lbs., largest in October, 228 lbs., and hundreds caught during last few months. I examined 164 specimens in the Honolulu markets, 757 to

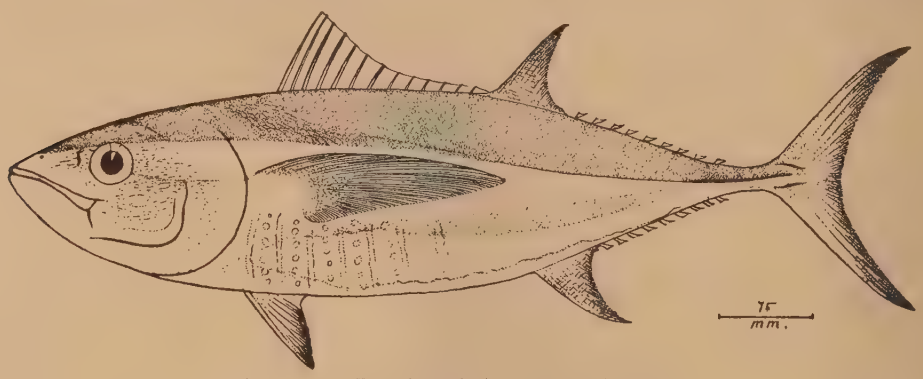

FIGURE 28.—Drawing of *Germo sibi* (Schlegel).

Pectoral long and falcate. Dorsal and anal lobes moderately elevated, much less than in *Germo macropterus*. Upper finlets yellow, edged dark and points white. Lower finlets pale, but without yellow.

Frequently in the Honolulu markets, where I saw at least fifty. Quite likely this is the same species as *Thynnus obesus* Lowe (Zool. Soc. London., Proc. pt. 9, 78, 1839, Maderia).

Jouan evidently reports this species as *Thynnus*, on a specimen over 120 mm. long from Kanala, New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 291, 1861):

D. XVII-14; A. 17. Caudal very forked. Blue on back, with black vertical streaks. Silvery-white on flanks and abdomen.

Germo macropterus (Schlegel).

Thynnus macropterus Schlegel: Fauna Japonica, Poiss., pts. 5-6, p. 98, pl. 51, 1844 (type loc., Japan).

Germo macropterus Jordan and Evermann: (U. S.) Bur. Fish., Bull., vol. 25, pt. 1, p. 228, 1905 (1906) ("Hawaii").—Jordan and Snyder: op. cit., vol. 26, p. 209, 1906 (1907) (correction).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 32, Dec., 1922 (Honolulu).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, pt. 376, 1923 (Honolulu).

Neothynnus macropterus Jordan and Evermann: California Acad. Sci., Occ. Papers, vol. 12, p. 20, pl. 5, Sept. 30, 1926 (Honolulu).

Germo germo (non Lacépède) Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, p. 1, p. 174, 1903 (1905) (Honolulu; Hilo).

1520 mm. long, during November and December 1922 and January 1923.

This would form the subgenus *Neothunnus* Kishinouye, easily known by its bright yellow finlets and elevated fin lobes. Possibly the *Thynnus albacora* Lowe (Zool. Soc. London, Proc., p. 77, 1839, Madeira) is the same.

Germo albacores (Bonnaterre).

Scomber albacares Bonnaterre: Encycl. method., p. 140, 1788 (type loc., Jamaica; on Sloane).

Neothynnus itosibi Jordan and Evermann: California Acad. Sci., Occ. Pap., vol. 12, p. 22, pl. 6. Sept. 30, 1926 (type loc., Honolulu market, photograph).

Known by the elongated soft dorsal and anal, their slender tips reaching at least to median finlet. Reaches upward of 300 cm.

Sarda chilensis (Cuvier) (Pl. IX, *B*).

Pelamys chilensis Cuvier: Hist. nat. Poiss., vol. 8, p. 118, 1831 (type loc., Valparaiso, Chili).

Sarda chilensis Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 28, p. 125, 1904 (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 175, 1903 (1905) (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 32, Dec., 1922 (Honolulu).

Distinguished from the Atlantic *Sarda sarda* (Bloch) in the fewer dorsal spines and the maxillary not reached beyond the eye.

Four in the Bishop Museum from Honolulu, 406 to 576 mm. I saw 3 in the Honolulu mar-

kets December 16, 1922. One in the National Museum from Honolulu.

Open Pacific.

Grammatorcynus thompsoni (Fowler).

Nesogrammus thompsoni Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 376, 1923 (type loc., Honolulu).

The type from Honolulu, in the Bishop Museum, obtained December 28, 1922, length 963 mm.

The genus *Nesogrammus* Evermann and Seale 1907 falls a synonym to *Grammatorcynus* Gill 1862.

Acanthocybium solandri (Cuvier) (Pl. IX, *C*).

Cybium solandri Cuvier: Hist. nat. Poiss., vol. 8, p. 141, 1831 (no type locality).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 153, pl. 94, 1876 (Thrum Cap Island, Paumotus; Hervey Islands).

Acanthocybium solandri Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 441, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 523, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 176, 1903 (1905) (copied).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 34, Dec., 1922 (Honolulu).

Scomber lanceolatus (Solander) Cuvier: Hist. nat. Poiss., vol. 8, p. 141, 1831 (name in text).

Cast of a specimen 1216 mm. long in the Bishop Museum, obtained in Honolulu. I examined 1 of 1520 mm., December 9, 1922; 2 of 1216 mm. December 30; and 2 adults, January 13, 1923.

Jordan and Hubbs separate the Japanese form as *Acanthocybium sara* (Lay and Bennett), with teeth 18/20 to 20/25 on each side of the jaw. The Hawaiian form, *Acanthocybium solandri,* is said to have teeth 50/50 to 75/60 each side.

Circumtropical.

GEMPYLIDAE

Gempylus serpens Cuvier.

Gempylus serpens Cuvier: Règne animal, 2nd ed., vol. 2, p. 200, 1829 (on *Serpens marinus* Sloane, voyage "Jamaica," vol. 1, p. 26, pl. 1, fig. 2, 1707, type loc., Tropic of Cancer).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 106, pl. 68, fig. B, 1875 (Hawaiian islands).

Lemnisoma thyrisitoides Lesson: Voyage "Coquille," Zool., pt. 2, vol. 1, p. 160, 1831 (type loc., South Sea near Paumotu Islands [S. Lat. 17°, E. Long. 108°]).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 179, 1903 (1905) (Puna to south of Hilo; Honolulu).—Nichols: Am. Mus. Novit., no. 94, p. 3, Oct. 19, 1923 (Ducie Island).

Gempylus coluber Cuvier: Hist. nat. Poiss., vol. 8, p. 155, pl. 221, 1831 (type loc., Tahiti).

Head 5; depth 3 1/4 in head; D. XXIX-II, 12-6; A. I-II, 10-7; snout 2 1/10 in head measured from upper jaw tip; eye 5 4/5; maxillary 1 7/8; interorbital 7 1/2, evenly concave. Head width 5 1/5 in its total length. Least depth of caudal peduncle 1 1/4 in eye. Maxillary reaches pupil. Three long anterior upper canines, none in lower jaw; row of small teeth on each palatine. Gill rakers perfect, 2 + 5 short weak denticles. Sixth dorsal spine 4 1/2 in head; first branched dorsal ray 4 2/5; first branched anal ray 4 2/5; pectoral 2 1/8; ventral 4 in eye. Nearly uniform dusky-slate.

One, 957 mm., from Honolulu, in the Bishop Museum.

Promethichthys prometheus (Cuvier) (Pl. IX, *D*).

Gempylus prometheus Cuvier: Hist. nat. Poiss., vol. 8, p. 156, pl. 222, 1831 (type loc., St. Helena, South Atlantic).

Thyrsites prometheus Günther: Mus. Godeffroy, Jour., vol. 4, p. 107, pl. 68, fig. A, 1875 (Cook Island; Tahiti).—Günther: Rept. voyage "Challenger," vol. 31, p. 7, pl. 1, figs. C-D, 1889 (Hawaiian islands).

Promethichthys prometheus Waite: Austral. Mus., Records, vol. 5, p. 3, 1903 (Paanopa, Ocean Island, Gilbert Islands).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 178, pl. 29, 1903 (1905) (Honolulu).

Thyrsites ballieui Sauvage: Soc. Philom. Paris, Bull., 7th ser., vol. 6, p. 170, 1882 (type loc., Hawaiian islands).

Promethichthys pacificus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 28, fig. 9, 1906 (type loc., Tahiti).

Promethichthys solandri Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., 4th ser., vol. 16, p. 653, Nov. 14, 1927 (Honolulu).

Head 3 2/3; depth 2; D. XVIII, III, 18-2; A. II, 16-2; snout 2 4/5 in head measured from upper jaw tip; eye 4; maxillary 2 1/4; interorbital 6. Head width 3 1/8 its length; pectoral 1 3/4. Dusky-sepia. Membranes of spinous dorsal black, other fins all brown.

Type of *Promethichthys pacificus* from Tahiti in the Bishop Museum, 608 mm. Also 11 from Honolulu, 164 to 577 mm. One in the Agassiz Museum from the Hawaiian islands, 354 mm. Two in the National Museum from the Hawaiian islands.

Circumtropical.

Ruvettus pretiosus Cocco (Pl. X, *A*).

Ruvettus pretiosus Cocco: Giorn. Sci. Sicilia, vol. 17, p. 21, 1829 (type loc., Messina, Italy).—Waite: Australian Mus., Mem., no. 3, p. 539, 1899 (South Pacific).—Waite: Australian Mus., Records, vol. 5, p. 3, 1903 (Paanopa, Ocean Island, Gilbert Group).—Snyder: U. S. Fish Comm., Bull., vol. 22, p. 523, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 177, fig. 67, 1903 (1905) (Honolulu).

Ruvettus pacificus Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 34, Dec., 1922 (on Jordan and Evermann).

Skin and cast in the Bishop Museum, 1140 mm. long from Honolulu, obtained about 1913. Six others reported subsequently, by J. W. Thompson. Two in the National Museum from Honolulu.

Ruvettus tydemani Weber (Siboga Exped., vol. 65, p. 401, pl. 8, fig. 4, 1913, type loc., Binongka Island, in 250 m.) is not different.

Circumtropical.

TRICHIURIDAE

Trichiurus haumela (Forskål).

Clupea haumela Forskål: Descriptiones animalum, pp. 13, 71, 1775 (type loc., Moccha, Red Sea).

Enchelyopus haumela Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).

Head 6 1/3; depth 14; D. 134; A. 107; eye 6 1/2 in head from snout tip; gill rakers 5+8. Silvery white,

back leaden gray. Dorsal whitish basally, upper edge grayish and dusky on anterior portion.

Indian Ocean and East Indies.

Lepidopus tenuis Günther.

Lepidopus tenuis Günther: Ann. Mag. Nat. Hist. London, 4th ser., vol. 20, p. 437, 1877 (type loc., off Inosima, Japan).—Günther: Rept. voyage "Challenger," vol. 31, p. 7, 1889 (between Hawaii and Tahiti, in S. Lat. 0° 33′, W. Long. 157° 34′).

Head 7; depth 28; D. 126; A. 71; lateral teeth rather strong, few; caudal very small; anterior anal rays hidden below skin. Uniform silvery. (Günther)

ISTIOPHORIDAE

Istiophorus orientalis (Schlegel).

Histiophorus orientalis Schlegel: Fauna Japonica, Poiss., pts. 5-6, p. 103, pl. 55, 1844 (type loc., southeast coast of Japan).

Istiophorus orientalis Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 378, 1923 (Honolulu).

Istiophorus gladius Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 30, fig. 2, Dec., 1922 (Honolulu).

Istiophorus eriquius (Jordan and Ball) Jordan and Evermann: Cal. Acad. Sci., Occ. Papers, vol. 12, p. 48, pl. 15, fig. 2, Sept. 30, 1926 (type loc., Honolulu market; on cast of Fowler's specimen).

Cast of specimen 2331 mm. long, and head 697 mm. long, from Honolulu, in the Bishop Museum. The head of this specimen shows: combined eye and postocular 2 1/2 in snout; eye 4 in postocular; interorbital 1 3/4; slender maxillary extends 1/3 an eye diameter beyond eye, upper jaw slightly depressed; lower jaw measured to front of eye 1 2/5 in rest of snout; no gill rakers, though gill filaments longer than eye. The cast shows: Dorsals XXXIV-I, 7; ventral rays united into one, flexible and terminally filamentous about 3/4 entire head length (also examined attached to head of specimen).

J. W. Thompson reports 12 seen, a few before the above was secured, largest 2582 mm. long. I found 3 adults in the Honolulu markets, one each November 4, 1922, November 11, and January 13, 1923.

The description and figure by Broussonet are not accompanied by any specific name, simply being referred to *Scomber* (Acad. Sci. Paris, Mem., p. 450, pl. 10, 1786 [1788], type loc., Sea of the Indies). The *Scomber gladius* Bloch (Nat. auslandichen Fische, pt. 7, p. 81, pl. 345, 1793) the next name, though a composite is largely referred to *Xiphias*.

Tetrapturus mitsukurii Jordan and Snyder.

Tetrapterus mitsukurii Jordan and Snyder: College Sci. Tokyo, Jour., vol. 15, pt. 2, p. 304, pl. 16, fig. 5, 1901 (type loc., Misaki, Tokyo, Yokohama, Sendai, Otaru).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 30, Dec., 1922 (Honolulu).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 378, 1923 (Honolulu).

Makaira mitsukurii Jordan and Evermann: California Acad., Occ. Papers, vol. 12, p. 61, pl. 18, Sept. 30, 1926 (Honolulu).

Makaira mazara Jordan and Evermann: California Acad., Occ. Papers, vol. 12, p. 53, pl. 11, fig. 2, Sept. 30, 1926 (Honolulu).

Makaira grammatica Jordan and Evermann: California Acad. Sci., Occ. Papers, vol. 12, p. 55, pl. 16, Sept. 30, 1926 (type loc., Honolulu market, photograph).

I examined a specimen in the Honolulu market, 1520 mm. long, December 2, 1922. Dorsal black, its height more than half of body, especially front lobe. Caudal well forked. Fresh in the market stalls it was dark or neutral dusky on the back, soiled whitish below. Also 25 others examined, through latter part of same month and early January 1923. One in the National Museum, also head and tail, from Honolulu.

Tropical and warmer parts of the Pacific.

Tetrapturus brevirostris (Playfair).

Histiophorus brevirostris Playfair: Fishes of Zanzibar, pp. 53, 145, 2 figs., 1866 (type loc., Zanzibar).

Tetrapturus illingworthi Jordan and Evermann: Cal. Acad. Sci., Occ. Papers, vol. 12, p. 32, pl. 8, Sept. 30, 1926 (type loc., Honolulu market, photograph).

Tetrapturus kraussi Jordan and Evermann: California Acad. Sci., Occ. Papers, vol. 12, p. 33, pl. 9, Sept. 30, 1926 (type loc., Honolulu market, photograph).

Tetrapturus ectenes Jordan and Evermann: California Acad. Sci., Occ. Papers, vol. 12, p. 34, pl. 11, fig. 2, Sept. 30, 1926 (type loc., Honolulu market).

First dorsal scarcely elevated as distinct lobe or about long as pectoral.

XIPHIIDAE

Xiphias gladius Linné (fig. 29).

Xiphias gladius Linné: Systema nat., 10th ed., p. 248, 1758 (type loc., European ocean).—Snyder: U. S. Fish Comm., Bull., vol. 22, p. 523, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 168, fig. 61, 1903 (1905) (Hilo).

Phaethonichthys tuberculatus Nichols: Am. Mus. Novit., no. 94, p. 2, fig. 1, Oct. 19, 1923 (tail) (type loc., Rapa Island, Austral Group).

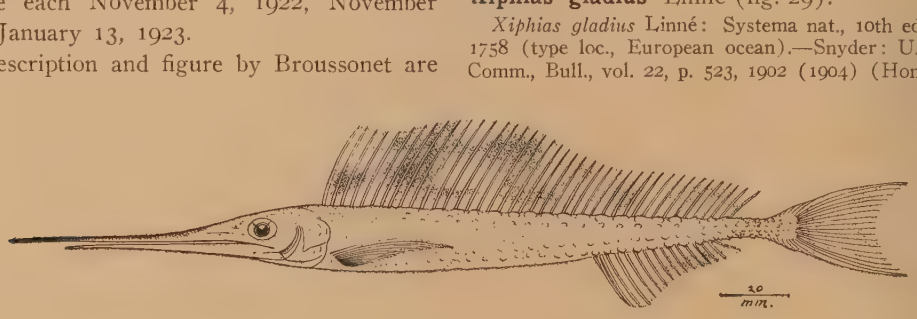

FIGURE 29.—Drawing of young *Xiphias gladius*.

Young specimen obtained in the Honolulu market October 17, 1922, now in the Bishop Museum. Two others, 507 mm. long, reported December 21, 1922.

The *Phaethonichthys tuberculatus* was described from the fragmentary posterior portion

of a young specimen of *Xiphias gladius*. It was taken from the gullet of a red-tailed tropic bird.

Circumtropical.

CORYPHAENIDAE

Coryphaena hippurus Linné (fig. 30).

Coryphaena hippurus Linné: Systema nat., 10th ed., p. 261, 1758 (type loc., Pelagic).—Lichtenstein: Descriptiones animalium, Forster, p. 155, 1844 (tropical Pacific).—Günther: Rept. voyage "Challenger," vol. 3, pt. 2, p. 9, 1888 (1889) (Low Archipelago).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 447, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 204, 1903 (1905) (Honolulu; Hilo).—Fowler: Copeia, no. 112, p. 82, Nov. 29, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 35, Dec., 1922 (Honolulu).

Coryphaena chrysurus Lacépède: Hist. nat. Poiss., vol. 3, pp. 174, 187 (pl. 18, fig. 2, in vol. 2), 1802 (type loc., S. Lat. 16°, Long. 170°, Pacific Ocean, Indian Ocean).—Valenciennes: Hist. nat. Poiss., vol. 9, p. 229, 1833 (Pacific in S. Lat. 15°-16°, Long. 165°-170°).

Coryphaena scomberoides Valenciennes: Hist. nat. Poiss., vol. 9, p. 234, 1853 (S. Lat. 18°, W. Long. 134° from Paris).

Two in the Bishop Museum from Honolulu. I examined 139 specimens, mostly adults at least 915 mm. long in the Honolulu markets during November and December 1922 and January 1923. Three in the National Museum from Honolulu. Four young in the Academy from the Hawaiian islands, obtained by W. H. Jones.

Pelagic in open warm or tropical seas.

FIGURE 30.—Drawing of young *Coryphaena hippurus*.

Coryphaena equiselis Linné (fig. 31).

Coryphaena equiselis Linné: Systema nat., 10th ed., p. 261, 1758 (type loc., Pelagic).

Coryphaena equisetis Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 147, pl. 93, fig. A, 1876 (between Tahiti and Hawaiian islands).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 101, 1912 (S. Lat. 13° 3', W. Long. 112° 44.9'; S. Lat. 14° 15', W. Long. 115° 13').

Coryphaena socialis F. D. Bennett: Narrative whaling voyage, vol. 2, p. 274, 1840 (type loc., N. Lat. 27°, W. Long. 166° [near Laysan]).

Distinguished from *C. hippurus* by its fewer fin rays, the dorsal 51 to 55 and the anal 24 to 26. Reaches 732 mm.

FIGURE 31.—Drawing of young *Coryphaena equiselis*.

One in the National Museum from Easter Island to Galapagos, January 2, 1905.

Pelagic in open warm seas.

BRAMIDAE

Brama raii (Bloch).

Sparus raii Bloch: Nat. auslandischen Fische, vol. 5, pt. 8, p. 95, pl. 273, 1791 (type loc., North Sea) (on *Brama marina* Ray; Synopsis methodica, Pisc., p. 115, 1713, type loc., Middelburg).

Eumegistus illustris Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 36, pl. 2, fig. 1, Dec., 1922 (type loc., Honolulu).—Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., 4th ser., vol. 16, p. 654 (Honolulu).

The species *Eumegistus illustris* is known only from the imperfect type in the Carnegie Museum, about 608 mm. long. It agrees closely with *Brama raii,* especially in the 12 gill rakers on the lower half of the first arch.

Pelagic.

Collybus drachme Snyder.

Collybus drachme Snyder: U. S. Fish Comm., Bull., vol. 22, p. 525, pl. 9, fig. 6, 1902 (1904) (type loc., off Niihau; Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 203, 1903 (1905) (Honolulu).—Jordan and Snyder: (U. S.) Bur. Fish., Bull., vol. 26, p. 211, 1906 (1907) (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 35, Dec., 1922 (Honolulu).

Head 3 1/5 to 3 1/2; depth 1 5/6 to 1 9/10; D. III, 30; A. I, 27; scales 54 in lateral line to caudal base and 5 more on latter; 23 scales transversely from dorsal origin; 32 predorsal scales; snout 4 in head; eye 3 1/5; maxillary 2 to 2 1/4; interorbital 3 2/3 to 3 7/8.

Three specimens in the Bishop Museum obtained in Honolulu, first about 1906. Length 167 to 186 mm. The type, obtained off Niihau in 537 to 672 fathoms, August 12, 1902, in the National Museum.

its length. Snout obtuse, convex, length half its width. Eye large, much longer than snout. Lower jaw slightly included in upper, strong. Maxillary well inclined, reaches back nearly to hind eye edge, expansion about 2 1/2? in eye. Teeth small, firmly erect, in broad bands in moderate number on palatines and in jaws; none on vomer. Nostrils large, close before eye. Interorbital well elevated convexly. Gill opening forward opposite front eye edge. Gill rakers v, I+8, III, lanceolate, strong, equal gill filaments which 2 1/3 in eye. Pseudobranchiae large as gill filaments. Scales crowded and uniformly small on predorsal, breast and head; large on trunk, especially sides, with edge of each gashed or emarginate; small scales at pectoral base, over caudal basally, also smaller ones on soft dorsal, anal and caudal; axillary ventral scale long as fin; maxillary finely scaled; scales with 3 basal lobes and angular above and below; cheek covered with scales, 16 across widest part to preopercle edge. First branched dorsal ray 1 1/3 in head; first branched anal ray 1 7/8; ventral 1 5/6. Pectoral reaches 1 3/4 to caudal base, 1 1/2 in combined head and trunk.

Deep brown, generally uniform. Iris dusky. Pectoral and ventral broadly paler marginally. Length 608 mm.

One obtained July 7, 1906 at Honolulu, in the Bishop Museum.

CENTROLOPHIDAE

Cubiceps thompsoni Fowler (fig. 32).

Cubiceps thompsoni Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 378, 1923 (type loc., Honolulu).

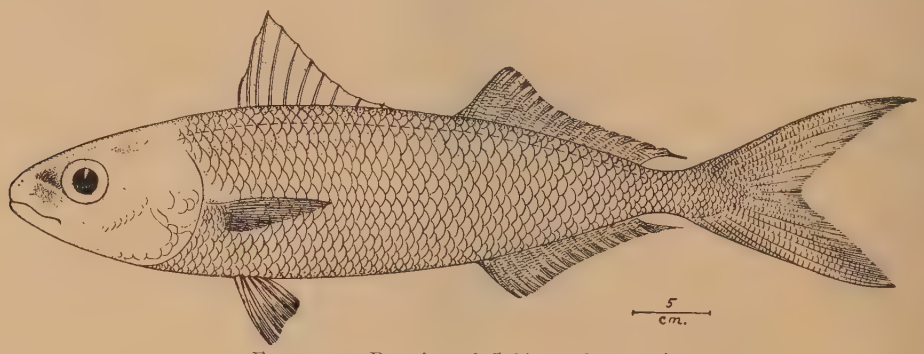

FIGURE 32.—Drawing of *Cubiceps thompsoni.*

Taractes orcini (Cuvier).

Brama orcini Cuvier: Hist. nat. Poiss., vol. 7, p. 220, 1831 (type from a large albicore near the Equator in 85° E. of Paris; Indian Ocean).

Taractes orcini Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 148, 1876 (South Sea).

D. III, 27; A. III, 27; body deepest before middle of back; depth 1 1/2; eye above middle of head. Uniform silvery. (Günther)

Taractes steindachneri (Döderlein) (Pl. X, *B*).

Argo steindachneri Döderlein: Akad. Wiss. Wien, Denk., vol. 49, p. 174, 1884 (type loc., Tokyo).

Taractes steindachneri Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 378, 1923 (Honolulu).—Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., 4th ser., vol. 16, p. 654 (Honolulu).

Head 3 1/4; depth 2 1/2; D. IV, 28; A. III, 20; P. II, 18; V. I, 5; scales 45 in median lateral series to caudal base; 23 scales transversely from anal origin; 34 predorsal scales; snout 3 1/2 in head; eye 2 4/5; maxillary 2; interorbital 3.

Body ovate, strongly compressed, greatest depth little before dorsal, sides flattened and body edges all convexly rounded. Least depth of caudal peduncle 4 in head. Head deep, compressed, sides flattened, width 1 3/4

Type and 2 paratypes from Honolulu, in the Bishop Museum.

Nomeus gronovii (Gmelin).

Gobius gronovii Gmelin: Systema nat., Linn., p. 1205, 1789 (type loc., American seas in Torrid Zone).

Nomeus gronovii Günther: Rept. voyage "Challenger," vol. 31, pt. 2, p. 13, 1888 (1889) (Low Archipelago).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 378, 1923 (Laie, Oahu).

Four specimens in the Bishop Museum, now in very poor condition, found at "Malaekahana," Oahu, July 4 to 6, 1916, by C. Montague Cooke III. Commensal with *Physalia,* found swimming just below sac. Striped blue and silver. Longest about 40 mm. One specimen also in the Bishop Museum, 15 mm. long, taken in Lat. N. 6° W. Long. 162° at surface.

Circumtropical.

Psenes cyanophrys Valenciennes.

Psenes cyanophrys Valenciennes: Hist. nat. Poiss., vol. 9, p. 193, pl. 265, 1833 (type loc., New Ireland).—

Günther: Rept. voyage "Challenger," vol. 31, pt. 2, p. 12, 1888 (1889) (south of New Guinea; between Philippines and New Guinea; north of New Guinea).

Psenes guamensis Valenciennes: Hist. nat. Poiss., vol. 9, p. 198, 1833 (type loc., Guam).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 145, pl. 91, fig. C, 1876 (South Sea).

Head 3 1/4 to 3 4/5; depth 1 4/5 to 2 1/5; D. X, I, 25 to 27; A. III, 25 to 27; scales 52 to 56, 4 or 5 above, 22 to 26 below; snout long as eye, which 3 1/4 to 3 4/5; maxillary to eye or little beyond; interorbital 2 2/3. Brownish with dark parallel lines or dots along rows of scales. Dorsals, anals and ventrals dark brown, pectorals white. Very young with irregular vertical bands. Length 125 mm. (Regan)

Pelagic in the Atlantic and Indo-Pacific.

Psenes arafurensis Günther (fig. 33).

Psenes arafurensis Günther: Rept. voyage "Challenger," vol. 40, p. 13, pl. 2, fig. G, 1888 (type loc., Arafura Sea).—Fowler: B. P. Bishop Mus., Bull. 26, p. 11, 1925 (Gardner Island).

One in the Bishop Museum, in very poor condition, found partly dried beside the nest of a noddy (*Anodus stolidus*) on Gardner Island, May 22, 1923, by S. C. Ball. Otherwise only known from the type, obtained in the Arafura Sea.

Schedophilus medusophagus Cocco.

Schedophilus medusophagus Cocco: Giorn. Cabin. Messina, vol. 1, p. 30, 1829 (type loc., Messina).—Cocco: Giorn. Innom. Messina Ann., vol. 3, p. 57, 1829.—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 149, 1876 (Samoa).

D. IV, 41 to 46; A. III, 24 to 27; scales 136 to 148, 26 to 30 above, 60 to 70 below. Pale olive, marbled darker. Length 100 (to 240) mm. (Regan)

Pelagic in the Mediterranean, Atlantic, and Pacific.

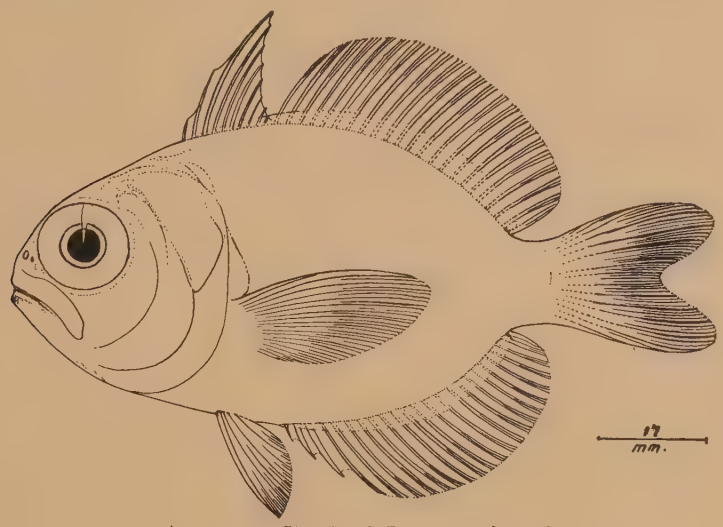

FIGURE 33.—Sketch of *Psenes arafurensis*.

Head 2 1/2; depth 1 3/4; D. X, 23; A. III, 21; scales 50? from above gill opening to caudal base; snout 5 in head; eye 2 1/3; maxillary 2 1/4; interorbital 3 1/4.

Body strongly compressed, deepest at soft dorsal origin. Caudal peduncle well compressed, least depth 2 2/5 in head.

Head width 2 2/5 in its length. Snout short, obtuse, width half its length. Eye large, much greater than snout or interorbital, its hind edge nearly midway in head length. Mouth large, inclined, jaws about even. Maxillary slender, reaches at least opposite middle of eye; expansion 1/4 of eye. Teeth in jaws uniserial; upper 21, conic, slightly curved, well separated, none on maxillaries; lower 48, compressed, pointed close-set. Palate and tongue edentulous. Nostril close before eye. Interorbital convex? Gill rakers 8 + 15, lanceolate, long as gill filaments, which 3 in eye.

Scales largely fallen, rather narrowly imbricated, cycloid; sometimes with 1 or 2 basal radiating striae; circuli 30 to 35, complete. Caudal base scaly. Dorsal spines rather flexible, third 1 2/3 in head; third ray 1 3/4. Anal spines graduated to third, which longest and 3 4/5 in head; second anal ray 2?; caudal 1 1/3?, forked; pectoral 1 1/8; ventral 1 3/4?

Dull brownish generally. Dorsals, caudal, anals and ventrals more or less with traces of dusky terminally. Pectoral pale. Length 68 mm.

Schedophilus maculatus Günther.

Schedophilus maculatus Günther: Cat. fishes Brit. Mus., vol. 2, p. 412, 1860 (type loc., China Sea).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 148, 1876 (South Sea).

Schedophilus marmoratus Kner and Steindachner: Akad. Wiss. Wien, Sitz., vol. 54, pt. 2, p. 366, 1866 (type loc., South Sea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 17, 1869 (South Sea).

D. VIII or IX, 27 to 30; A. III, 21 to 24; scales 100 to 108, 21 or 22 above, 45 to 47 below. Pale yellowish brown, purple tinge above, silvery beneath. Large blotches and bands of darker reddish-brown, on dorsal, anal, ventral and caudal also and last with large brown spot at base of each lobe. Length 44 mm. (Regan)

Pelagic in Chinese Seas, South Seas, Australia.

Schedophilus paucidens (Günther).

Lirus paucidens Günther: Rept. voyage "Challenger," vol. 31, no. 2, p. 11, pl. 2, fig. E, 1888 (1889) (type loc., from New Guinea to Japan).

D. VII, 23 to 24; A. III, 19 to 21; scales 100, 13 to 15 above, 34 to 36 below. Brown. Pectoral and caudal white. Length 35 mm. (Regan).

Differs from *Psenes arafurensis* and *Psenes cyano-*

phrys in the short dorsal spines not graduating to the higher soft rays.

Pelagic.

TETRAGONURIDAE

Tetragonurus cuvieri Risso.

Tetragonurus cuvieri Risso: Ichth. Nice, p. 347, pl. 10, fig. 37, 1810 (type loc., Nice).

Head 3 2/3; depth 5 1/3; D. XIX, 14; A. 13; P. 14; V. I, 5; scales 100 along lateral line to caudal base medianly; 7 scales above lateral line to spinous dorsal origin, 12 below to spinous anal origin; 25 predorsal scales to occiput; snout 2 4/5 in head; eye 4 1/3; maxillary 2 1/5; interorbital 3 2/3.

Body moderately compressed, elongate, slender and tapering to slender caudal peduncle, deepest at spinous dorsal. Caudal peduncle compressed, least depth 6 in its length or 5 1/3 in head.

Head well compressed, sides flattened, but slightly approximated below, width 3 1/2 in its length. Snout conic, width 1 1/2 in its length. Eye large, high, hind pupil edge midway in head length; diameter 1 1/2 in snout, slightly greater than interorbital. Mouth large, jaws massive, lower shorter. Maxillary extends little beyond front eye edge, though not quite opposite front pupil edge. Lips fleshy and rather broad, adnate. Single row of compressed teeth in each jaw; upper about 32, conic, subequal, rather well spaced, not so large as largest below; lower about 36, broad, close-set, compressed and graduated larger as they progress posteriorly. Vomer and palatines with a few small conic teeth. Tongue slender, its tip slightly free. Nostrils small, simple pores; front nostril at first 2/5 in snout; hind nostril at last third in snout. Interorbital broadly convex.

Gill opening extends forward opposite front pupil edge. Gill rakers 7 + 9, lanceolate, long as gill filaments or 2 1/4 in eye. Pseudobranchiae long as gill filaments.

Head, except muzzle and cranium, scaly. Scales on trunk all in longitudinal series, keeled, very firmly adherent and keel of each scale with row of 1 to 3 marginal denticles directed backward. Preopercle with spinescent edge, largest spine at angle. Very small scales cover caudal basally. Lateral line at first parallel with dorsal profile and then slopes nearly median along side of caudal peduncle to middle of caudal base, its entire course marked as a shallow groove. Each side of caudal basally with 2 keels somewhat convergent posteriorly, each little longer than eye. Belly with narrow median groove from ventral fin to vent, which close before anal, over which scales not passing.

Dorsal spines fragile, slender and pungent, fourth 5 in head; sixth dorsal ray 2 1/4; fourth anal ray 2 1/5; caudal 1 1/2, with median rays forming an obtuse angle posteriorly; pectoral 1 9/10; ventral 2 9/10.

Color uniform brownish generally, under surface paler. Iris with neutral-gray to silvery tints. Length 94 mm.

In the Agassiz Museum 1 specimen from the island of Hawaii. This is a very interesting addition to the fauna of Oceania.

CARANGIDAE

Steindachner has described a young specimen, 80 mm. long, as *Caranx longipes* (Akad. Wiss. Wien, Sitzs., vol. 115, pt. 1, p. 1404, 1904, type loc., Upolu, Samoa). He emphasizes the long ventrals reaching the first branched anal rays and the relatively short oval pectoral. Though considerable details are given no counts of fin rays, scutes, gill rakers, etc. are noted. This specimen therefore approaches *Citula atropos* (Schneider) as noticed by Fowler and Bean (U. S. Nat. Mus., Proc., vol. 62, p. 21, 1922) but differs in the presence of a dark brown opercular blotch.

An unidentifiable *Scomberoides* (Soc. Cherbourg, Mem., vol. 8, p. 293, 1861) has been reported from Kanala, New Caledonia, by Jouan. It may have been intended for any of the 3 following species. The back and head are said to be blue and the flanks silvery. Length 230 mm.

Scomberoides lysan (Forskål).

Scomber lysan Forskål: Descriptiones animalium, pp. 12, 54, 1775 (type loc., Djedda and Lohaja, Red Sea).

Chorinemus lysan Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 358, 1882 (New Guinea).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 132, 1913 (Beo, Waigiu).

Scomber forsteri Schneider: Systema ichth., Bloch, p. 26, 1801 (type loc., Pacific Ocean).

Scomber maculatus Lichtenstein: Descriptiones animalium, Forster, p. 195, 1844 (type loc., Tahiti).

Scomberoides commersonianus Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).

Distinguished from the following two species by its deeper body and longer maxillary, which reaches beyond the eye.

Indo-Pacific, from the Red Sea to the East Indies and Tahiti.

Scomberoides toloo parah (Rüppell).

Lichia toloo parah (Cuvier) Rüppell: Atlas Reis. Nord. Afrika, Fisch., p. 91, 1828 (type loc., Massaua, Red Sea).

Scomberoides tolooparah Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 180, 1903 (1905) (Honolulu; Hilo; Waialua).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 267, 1911 (Suva, Fiji; Rangiroa, Paumotus; Vavau, Tonga Islands; Funafuti, Ellice Islands; Gilberts; Nukuhiva, Marquesas; Arhno and Jaluit, Marshalls).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 37, Dec., 1922 (Honolulu).

Chorinemus toloo Schmeltz: Mus. Godeffroy, Cat. 4, p. 17, 1869 (Samoa).—Peters: Akad. Wiss. Berlin, Monatsb., p. 836, 1876 (1877) (Cartaret Harbor, New Ireland).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 358, 1882 (New Guinea).

Scomberoides tooloo Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 17, 18, 1902 (Honolulu).

Chorinemus sancti-petri (non Valenciennes) Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 138, 1876 (part).

Chorinemus moadetta Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 495, 1901 (Honolulu).

Scomberoides tala (non Cuvier) Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 441, 1902 (1903) (Honolulu).

Head 4 1/4; depth 3 1/3; D. I, VII, 11, 19; A. II-1, 18; snout 3 1/5 in head from upper jaw tip; eye 4 3/4; maxillary 2, reaches hind pupil edge; interorbital 3. Scales lanceolate. No large blotches as in *Scomberoides sancti-petri*, but a row of smaller ones below arch of lateral line. Soft dorsal blackish apically, fin otherwise brownish.

The Bishop Museum has 7 from Honolulu. One 329 mm. long a distorted hunch back. I examined 85 specimens in the Honolulu mar-

kets in November and December 1922 and January 1923. In the National Museum 2 from Hilo and 3 without locality, likely from Oceania, obtained by the Wilkes Expedition. Largest 449 mm. Others are 7 from Honolulu, 6 Hilo, 3 Nukuhiva, 4 Suva, 2 Rangiroa, 1 Gilbert Islands, 1 Arhno Atoll, 1 Marshall Islands, 1 Jaluit, 1 Vavau, 1 Funafuti. The Agassiz Museum has 3 from Nukuhiva, 1 Society Islands, and 2 Hawaiian.

Indo-Pacific from the Red Sea to the East Indies, Polynesia and Hawaii.

Scomberoides sancti-petri (Cuvier) (fig. 34).

Chorinemus sancti-petri Cuvier: Hist. nat. Poiss., vol. 8, p. 279, pl. 236, 1831 (type loc., Malabar).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 17, 1869 (Viti Islands).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 138, 1876 (Kingsmills; Samoa; Society Islands; Hawaiian islands).—Streets: U. S. Nat. Mus., Bull., no. 7, pp. 70, 89, 1877 (Honolulu; Christmas Island).—Waite: Australian Mus., Mem., vol. 3, p. 189, 1897 (Funafuti, Ellice Islands).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 496, 1901 (Honolulu).

Scomberoides sancti-petri Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 442, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 181, 1903 (1905) (Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 30, 1906 (Tahiti).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 229, 1905 (1906) (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 266, 1911 (Nukuhiva, Marquesas Islands).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 37, Dec., 1922 (not common, Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 25, 32, 1925 (Guam; Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 12, 1925 (Johnston Island).—Fowler: B. P. Bishop Mus., Bull. 38, p. 11, 1927 (Honolulu).

Scombroides sancti petri Smith and Swain: U. S. Nat. Mus., Proc., vol. 5, p. 124, 1882 (Johnston Island).—Snyder: U. S. Fish Comm., Bull., vol. 22, p. 523, 1902 (1904) (Honolulu).

Scomberoides moluccensis Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 56, fig. 1, 1905 (Polynesia?).

Head 4 3/4 to 5, in young 3 1/2; depth 3 2/5 to 4 1/4, in young 3 1/5; D. I, VI or VII, 1 or II, 19 or 20—1; A. II-1, 17 or 18—1; snout 3 1/4 to 3 3/5, 3 1/2 in young, in head from upper jaw tip; eye 3 1/2 to 5, 3 3/4 in young; maxillary 1 2/3 to 2, 1 3/4 in young, reaches hind edge of eye, or 3/5 in young; interorbital 3 1/4 to 4. Gill rakers 7 to 9+16 to 18, lanceolate, equal gill filaments or 1 1/5 to 1 3/5 in eye. Scales lanceolate; circuli moderately large, complete in young, more numerous and incomplete down median axis in young. Adult slaty on back, below whitish. Along costal region just above and behind pectoral 4 or 5 rather obscure dusky blotches. Dorsal blackish terminally, pale basally. Caudal slaty, hind edge pale. Pectoral tinged pale dusky. Anal whitish, with dusky blotch below middle. Ventral white.

One in the Academy from Christmas Island from W. H. Jones, 2 labeled Polynesia?, 1 Maui, 1 Apia, 1 Honolulu. In the Bishop Museum 1 from Honolulu; 2 from Johnston Island in 1923; 2 from Tahiti, obtained by Alvin Seale in 1901. Largest 663 mm. In the National Museum 1 from Honolulu from T. H. Streets, 1 Johnston Island, 3 Christmas Island, and 1 Nukuhiva.

The figure of *Scomberoides moluccensis* I made in 1905 [see fig. 34], compared with the original specimen from which it was drafted is slightly inaccurate. The left maxillary really extends only about 3/5 of the eye or not quite to the hind pupil edge.

Red Sea and East Africa to the East Indies, Polynesia, and Hawaii.

Seriola purpurascens Schlegel (Pl. X, *C*).

Seriola purpurascens Schlegel: Fauna Japonica, Poiss., pts. 7-9, p. 113, pl. 61, 1845 (type loc., Japan).—Snyder: U. S. Fish Comm., Bull., vol. 22, p. 523, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 183, 1903 (1905) (Honolulu).

Seriola dumerili (non Risso) Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 136, pl. 90, fig. a, 1876 (part; Hawaiian islands).

Head 3 1/2; depth 4 1/4; D. VI-I, 31; A. II-I, 21; scales 180 in lateral line to caudal base; snout 2 4/5 in head; eye 7 2/5; maxillary 2 2/5; interorbital 2 3/4. Snout conic, width 1 1/10 its length. Maxillary reaches front pupil edge, expansion slightly greater than eye. Gill rakers 18 on lower half of first arch. Dusky blotch just before pectoral base.

In the Bishop Museum 7 specimens from Honolulu, largest 1089 mm. I found 177 specimens, mostly adults, in the Honolulu markets during November and December 1922 and January 1923. Two Hawaii specimens in the National Museum. One in the Agassiz Museum from Hawaii.

Hawaii to Japan.

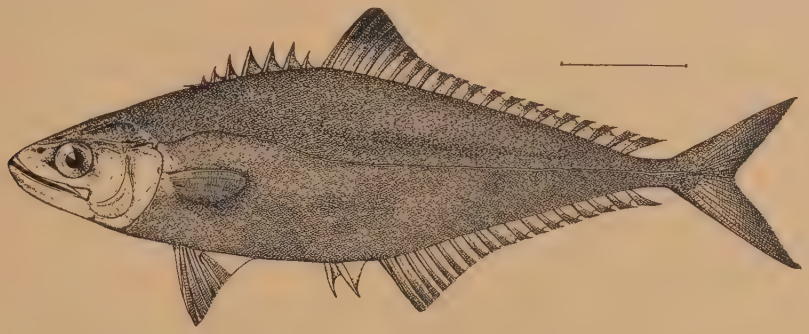

FIGURE 34.—Drawing of *Scomberoides sancti-petri*.

Seriola aureo-vittata Schlegel.

Seriola aureo-vittata Schlegel: Fauna Japonica, Poiss., pts. 7-9, p. 115, pl. 62, fig. 1, 1845 (type loc., Nagasaki).

Seriola sparna Jenkins: U S. Fish Comm., Bull., vol. 22, p. 442, fig. 14, 1902 (1903) (type loc., Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 37, Dec., 1922 (Honolulu).

Distinguished from *S. purpurascens* by a few more gill rakers (22) on the lower part of the first arch.

Type of *Scriola sparna* in the National Museum.

Hawaii to Japan.

Seriola nigrofasciata (Rüppell).

Nomeus nigrofasciatus Rüppell: Atlas Reis. Nord. Afrika, Fisch., p. 92, pl. 24, fig. 2, 1828 (type loc., Massaua, Red Sea).

Seriola nigro-fasciata Günther: Cat. fishes Brit. Mus., vol. 2, p. 465, 1860 (Louisiades).

Bluish gray, with 5 vertical bands on body and 1 or 2 narrower bands on head. First dorsal, ventral and anal black. Caudal yellowish, young with black blotch in last portion of each lobe. (Day)

Red Sea and East Africa to the East Indies and Louisiades.

Seriola tapeinometopon Bleeker.

Seriola tapeinometopon Bleeker: Nat. Tijds. Ned. Ind., vol. 5, p. 80, 1853 (type loc., Lawajong, Solor).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

Head 3 2/3; depth 3 1/2; D. VII-I, 30; A. II-I, 20; maxillary reaches below pupil. Oblique black band from spinous dorsal to eye; body with 5 or 6 brownish cross bands; dorsal and anal fins with yellow margin. (Günther)

Naucrates ductor (Linné) (figs. 35, 36).

Gasterosteus ductor Linné: Systema nat., 10th ed., p. 295, 1758 (type loc., Pelagic, following sharks).—Lichtenstein: Descriptiones animalium, Forster, p. 257, 1844 (Tanna).

Naucrates ductor Günther: Cat. fishes Brit. Mus., vol. 2, p. 374, 1860 (South Pacific).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 17, 1869 (South Seas).—Schmeltz: op. cit., Cat. 5, p. 26, 1874 (South Sea in S. Lat. 2°, W. Long. 22°).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 137, 1876 (all tropical seas).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 182, 1903 (1905) (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 25, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 12, 1925 (Laysan).

Naucrates indicus Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 147, pl. 14, fig. 2, 1830 (type loc., New Ireland).

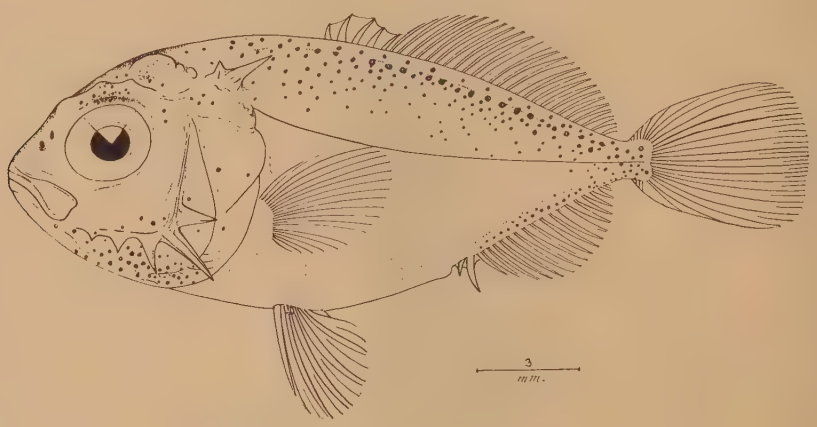

FIGURE 35.—Drawing of larval *Naucrates ductor*.

FIGURE 36.—Drawing of young *Naucrates ductor*.

Head 4; depth 4 1/6; D. IV, 1, 27; A. II, I, 16; snout 3 1/6 in head; eye 5 4/5; maxillary 3; interorbital 2 4/5. In alcohol dark bluish-brown. Side with 7 broad vertical dark bands, extending on fins. Dorsal lobe blackish. Tip of each caudal lobe white. Pectoral dusky terminally, tip whitish, base pale.

In the Bishop Museum 3 from Honolulu, 2

of which obtained in 1916 and 1919, the other without date of capture. J. W. Thompson reported 1 in 1920, 1 adult December 21, 1922 and 2 specimens January 2, 1923. The last 3 I examined fresh. Length 254 to 318 mm. One from Laysan in 1923. One in the National Museum from Oahu, obtained by the Wilkes Expedition, 223 mm. long. Also a half-grown specimen from Honolulu, obtained by W. H. Pease.

Jouan (Soc. Cherbourg, Mem., vol. 8, p. 291, 1861) describes as *Gasterosteus* a specimen 180 mm. long from the open sea 60 leagues south-south-east of New Caledonia.

Pelagic in all warm seas.

Elagatis bipinnulatus (Quoy and Gaimard) (Pl. XI, *A*).

Seriola bipinnulata Quoy and Gaimard: Voyage "Uranie," Zool., p. 363, pl. 61, fig. 3, 1825 (type loc., "Iles des Papous").

Elagatis bipinnulatus F. D. Bennett: Narrative whaling voyage, vol. 2, p. 283, 1840 (N. Lat. 6°, E. Long. 80°, Pacific Ocean; Equator 140° E. Long.).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 185, 1903 (1905) (Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 30, fig. 10, 1906 (Shortland Island, Solomons).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 37, Dec., 1922 (Honolulu).

Seriolichthys bipinnulatus Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 136, pl. 90, fig. B, 1876 (Society Islands).—Peters: Akad. Wiss. Berlin, Monatsb., p. 836, 1876 (1877) (New Britain).—Günther: Rept. voyage "Challenger," vol. 31, pt. 2, p. 8, pl. 1, figs. E-F, 1888 (1889) (north of New Guinea).

Head 4 1/5; depth 4 4/5; D. VI-I, 1, 32-2; A. I, 1, 16-2; scales 90 in lateral line to caudal base and 2? more on latter; head width 2 in its length; snout 1 2/3 in head measured from upper jaw tip; eye 6 1/2; maxillary 3; interorbital 2 3/5. Gill rakers 11 + 24, lanceolate, equal gill filaments or eye. Scales with 21 to 25 basal radiating striae, 6 to 12 more auxiliaries; striae 13 apically, finely undulate. Olivaceous above, pale or whitish below. Lower fins paler.

Two in the Bishop Museum from Tahiti, one from Honolulu and one from Shortland Island. Largest 608 mm. In the Honolulu markets I examined 46 specimens, largest 912 mm., during November and December 1922. Partly-skinned adult in the Agassiz Museum from the Society Islands.

Circumtropical.

Megalaspis cordyla (Linné).

Scomber cordyla Linné: Systema nat., 10th ed., p. 298, 1758 (type loc., "America").

Megalaspis cordyla Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 229, 1905 (1906) (Samoa).—Fowler: B. P. Bishop Mus., Bull. 22, p. 32, 1925 (Samoa).—Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., 4th ser., vol. 16, p. 655, November 14, 1927 (Honolulu).

Caranx rottleri Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 130, 1876 (Samoa).

Readily distinguished from *Caranx* by the presence of several finlets behind the dorsal and anal fins. Day quotes fishermen as reporting it reaches 1525 mm. in length.

Red Sea and East Africa to the East Indies, Samoa and Hawaii.

Decapterus sanctae-helenae (Cuvier) (Pl. XI, *B*).

Caranx sanctae-helenae Cuvier: Hist. nat. Poiss., vol. 9, p. 28, 1833 (type loc., Saint Helena, South Atlantic).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 130, 1876 (Tahiti; Hawaii; Raiatea; Bonin Islands; Paumotus).

Decapterus sanctae-helenae Schmeltz: Mus. Godeffroy, Cat. 6, p. 14, 1877 (Raiatea).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 495, 1901 (Honolulu).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 97, 1912 (Easter Island).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 378, 1923 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 25, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 12, 1925 (Lisiansky and Johnston Island).

Caranx pinnulatus Eydoux and Souleyet: Voyage "Bonite," Zool., vol. 1, p. 165, pl. 3, fig. 1, 1841 (type loc., Hawaiian islands).

Decapterus pinnulatus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 186, 1903 (1905) (Honolulu).—Jordan and Snyder: (U. S.) Bur. Fish., Bull., vol. 26, p. 210, 1906 (1907) (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 37, Dec., 1922 (Honolulu).

Decapterus macarellus pinnulatus Nichols: Am. Mus. Novit., no. 94, p. 3, Oct. 19, 1923 (Mangareva).

Caranx muroadsi Waite: Australian Mus., Mem., vol. 3, p. 189, 1897 (Funafuti, Ellice Islands).—Kishinouye: College Agri. Tokyo, Jour., vol. 2, p. 385, 1911 (Hakajima, Bonin Islands).

Decapterus canonoides Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 442, pl. 4, 1902 (1904) (type loc., Honolulu).—Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., 4th ser., vol. 16, p. 655, November 14, 1927 (Honolulu).

In the National Museum one from Oahu and 2 "probably Pacific," obtained by the Wilkes Expedition. Length 188? to 300 mm. Type of *Decapterus canonoides*, 2 from Honolulu, and 1 from Easter Island. Four in the Bishop Museum from Honolulu, largest 510 mm., 1 from Lisiansky and 1 from Johnston Island, in 1923. In the Honolulu markets I examined 1455 specimens during November and December 1922 and January 1923. In the Agassiz Museum 5 Hawaiian and 7 from the Society Islands.

Pelagic in the tropical Atlantic and Indo-Pacific.

Decapterus maruadsi (Schlegel).

Caranx maruadsi Schlegel: Fauna Japonica, Poiss., pts. 5-6, p. 109, pl. 58, fig. 2, 1844 (type loc., Nagasaki).

Decapterus maruadsi Nichols: Am. Mus. Novit., no. 50, p. 2, Oct. 24, 1922 (Hawaiian islands).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 38, Dec., 1922 (Honolulu).

Differs from *D. sanctae-helenae* in the larger opercular black blotch, extending on the humeral arch and apparently no gilded lateral streak. Reaches 275 mm.

Nichols reports 2 specimens from Honolulu, the larger 305 mm. long.

Selar boops (Cuvier).

Caranx boops Cuvier: Hist. nat. Poiss., vol. 9, p. 35, 1833 (type loc., Amboina; Vanicolo).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 24, 1885 (Rubi, New Guinea).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 132, 1913 (Saonek, Waigiu).

Caranx boofs Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 266, 1883 (China Straits, New Guinea).

Trachurops crumenophthalmus (non Bloch) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 30, 1906 (Faté; Shortland Island).

Readily distinguished from *Selar crumenophthalmus* by the large plates throughout the whole of the straight section of the lateral line.

In the Bishop Museum 11 specimens from Shortland Island, Solomons and Faté, New Hebrides. Largest 228 mm.

FIGURE 37.—Drawing of young *Selar crumenophthalmus*.

Caranx frecri Evermann and Seale (U. S. Bur. Fish., Bull., vol. 26, p. 63, fig. 4, 1906 [1907]) is a synonym.

East Indies to Micronesia and Melanesia.

Selar crumenophthalmus (Bloch) (fig. 37).

Scomber crumenophthalmus Bloch: Nat. auslandischen Fische, vol. 7, pt. 10, p. 77, pl. 343, 1793 (type loc., Acara Bay, West Africa).

Caranx crumenophthalmus Günther: Cat. fishes Brit. Mus., vol. 2, p. 429, 1860 (Pearl Islands; Aneiteum, New Hebrides).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 17, 1869 (Samoa).—Schmeltz: op. cit., vol. 5, p. 27, 1874 (Samoa; Tonga).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 131, 1876 (Hawaiian islands; Society Islands; South Seas).—Günther: Rept. voyage "Challenger," vol. 1, pp. 56, 59, 1880 (Nares Harbor, Admiralty Islands; Honolulu).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 495, 1901 (Honolulu).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 132, 1913 (Saonek, Waigiu).

Caranx crumenothalmus Waite: Australian Mus., Mem., vol. 3, p. 189, 1897 (Funafuti, Ellice Islands).

Trachurops crumenophthalmus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 501, 1900 (Hawaii).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 16, 18, 1902 (Honolulu).—Jenkins: U. S. Fish Comm., Bull. 22, p. 443, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 187, 1903 (1905) (Honolulu, Kailua, Hilo, Hoopuloa).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 30, 1906 (Tahiti; Rarotonga; Nukuhiva).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1403, 1906 (Upolu; Savaii).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 268, 1911 (Fakarava, Tuamotus).

Trachurops crumenophthalma Snyder: U. S. Fish Comm., Bull., vol. 22, p. 523, 1902 (1904) (Haualei Bay, Kauai).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 230, 1905 (1906) (Samoa).

Selar crumenophthalmus Fowler: Copeia, no. 122, p. 82, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 32, 1925 (Samoa).

Caranx torvus Jenyns: Zool. voyage "Beagle," Fishes, p. 69, pl. 15, 1842 (type loc., Tahiti).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 17, 1869 (Samoa).

Caranx atun Thiollière: Fauna Woodlark, p. 172, 1857 (type loc., Woodlark Island).

Trachurops mauritianus Streets: U. S. Nat. Mus., Bull., no. 7, p. 68, 1877 (Honolulu).

Selar mauritianus Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 38, Dec., 1922 (note).

Caranx macrophthalmus Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 132, 1913 (Saonek, Waigiu).

The Bishop Museum contains 9 from Honolulu and one from each of the following: Tahiti, Nukuhiva, and Rarotonga. I found about 1350 specimens in the Honolulu markets during November and December 1922 and January 1923, where it was abundant most every day. The Wilkes Expedition obtained 2 specimens, though without locality likely from Polynesia, now in the National Museum. Others are 2 adults and 3 young from Honolulu and 3 adults from Christmas Island, from T. H. Streets. Also 2 Honolulu specimens, 1 from Samoa, and 1 Fakarava. In the Agassiz Museum 4 from the Society Islands, 2 Hawaiian, 6 from Honolulu from W. H. Jones in 1874, 1 Pago Pago and 1 Fakarava. The Academy has 2 Hawaiian specimens received from W. H. Jones.

Circumtropical.

Trachurus trachurus (Linné).

Scomber trachurus Linné: Systema nat., 10th ed., p. 298, 1758 (type loc., Mediterranean).—Lichtenstein: Descriptiones animalium, Forster, pp. 155, 257, 1844 (tropical Pacific Ocean; Tanna).

Caranx ginal Thiollière: Fauna Woodlark, p. 175, 1857 (type loc., Woodlark Island).

Body formed as in *Caranx*. Depth not quite 3 1/3 without caudal. Mouth protractile, lengthened as in the saurel or mackerel. Lateral line slightly bent. First dorsal higher than second, which somewhat pointed in

front. Anal rays equal, short. Pectoral moderately long. Ventral very small. Silvery, back plumbeous-gray. Gold band on flanks. Dorsal and caudal tinged yellowish. Black spot on upper border of opercle. (Thiollière)

Provisionally I have left this species with the Atlantic form. No material has been reported in recent times.

Caranx mate Cuvier.

Caranx mate Cuvier: Hist. nat. Poiss., vol. 9, p. 40, 1833 (type loc., Pondicherry; Seychelles; New Guinea; Anjer Strait).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 12, 1925 (Midway Island).

Caranx affinis Rüppell: Neue Wirbelth. Fisch., p. 49, pl. 14, fig. 1, 1835 (type loc., Massaua, Red Sea).—Vaillant: Soc. Philom. Paris, Bull., 7th ser., vol. 11, p. 53, 1886-87 (Tahiti).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 166, 1902 (Honolulu).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 132, 1913 (Waigiu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 25, 1925 (Honolulu).

Caranx (Selar) affinis Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 195, 1901 (Honolulu).

Carangus affinis Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 195, fig. 76, 1903 (1905) (Honolulu).

Atule affinis Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 38, Dec., 1922 (Honolulu).

Selar hasselti Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, pp. 3, 4, 1859 (Doreh, New Guinea).

Caranx hasselti Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 356, 1882 (New Guinea).

Carangus politus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 445, fig. 17, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 194, 1903 (1905) (type; Honolulu).

Decapterus lundini Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 229, fig. 27, 1905 (1906) (type loc., Pago Pago, Samoa).

Caranx affinis lundini Nichols: Am. Mus. Novit., no 50, p. 1, Oct. 24, 1922 (Hawaiian islands).

Head 3 1/8; depth 2 2/3; D. I, VIII-I, 24?; A. II-I, 19; scales 40? + 38 in lateral line, last 8 on caudal base; snout 3 3/4 in head; eye 3; maxillary 2 1/8; interorbital 4. Gill rakers 11 + 32.

One in the National Museum from Fiji, obtained by the Wilkes Expedition, 44? mm. long. Also type of *Carangus politus,* 3 adults from Hawaii, and 8 young from same locality, obtained by Henderson and Bartsch in 1920. Six Honolulu specimens in the Bishop Museum, largest 273 mm. One from Midway Island in 1923. I found 42 specimens in the Honolulu markets in November and December, 1922, and January, 1923.

Jordan and Seale wrongly referred this fish to *Decapterus.* The black opercular blotch is reflected on the scapular arch, though on many only inside the gill opening.

Red Sea to the East Indies, Tahiti and Hawaii.

Caranx kuhlii (Bleeker) (Pl. XII, *A*).

Selar kuhlii Bleeker: Nat. Tijds. Ned. Ind., vol. 1, p. 360, 1850 (1851) (type loc., Batavia, Cheribon, Surabaja; Kammal, Tandjong, Madura).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).

Caranx kuhlii Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 378, 1923 (Honolulu).

Caranx kuhli Fowler: B. P. Bishop Mus., Bull. 22, p. 25, 1925 (Honolulu).

Head 3 3/4; depth 3 2/3; D. VIII-I, 23; A. II-I, 18; scales 47 + 46, of which last 4 on caudal base; snout 3 1/8 in head measured from upper jaw tip; eye 4 3/4; maxillary 2 7/8; interorbital 3 1/4. Head width 1 9/10 in total length of head. Fine villiform teeth on vomer and palatines and in jaws, though latter with larger outer row. Gill rakers 14 + 28, lanceolate, slender, about equal gill filaments or 1 1/8 in eye. Breast scaled. Curve of lateral line 1 1/2 in straight section. Pectoral reaches twelfth scute of lateral line, longer than head by snout length. Large black blotch on opercle edge only, larger than pupil.

Two in the Bishop Museum. One from J. W. Thompson, who obtained it in the Honolulu market. The other caught on a line off Koko Head, Oahu, December 25, 1922, by C. A. Reeves. Both 341 mm. long.

Apparently related to *Caranx mate,* but differs in the black opercular spot confined to the opercular edge and not reflected or supplemented by a smaller one on the shoulder-girdle, largely inside the gill opening opposite. It differs further in the longer pectoral, which extends well beyond the beginning of the straight section of the lateral line. Adipose eyelid not so broad, only hind half developed.

Caranx ascensionis (Osbeck) (Pl. XII, *B*).

Scomber adscensionis (Forster) Osbeck: Voyage to China, vol. 2, p. 94, 1771 (type loc., Ascension Island, Atlantic Ocean).

Caranx ascensionis Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 132, 1876 (non pl. 85) (Society Islands; Kingsmills).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 73, 1900 (1901) (Guam).—Fowler: B. P. Bishop Mus., Bull. 22, p. 32, 1925 (Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 12, 1925 (French Frigates Shoal and Johnston Island).—Fowler: op. cit., Bull. 38, p. 12, 1927 (Christmas Island).

Carangus ascensionis Streets: U. S. Nat. Mus., Bull., no. 7, p. 88, 1877 (Fanning Islands).

Caranx melampygus Cuvier: Hist. nat. Poiss., vol 9, p. 87, 1833 (type loc., Waigiu; Rawak, Buru; Vanicolo; Mauritius).—Günther: Cat. fishes Brit. Mus., vol. 2, p. 446, 1860 (Guadaleana; Tonga; Wanderer Bay).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 133, pl. 86, 1876 (Raiatea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 335, 1882 (New Guinea).—Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 128, 1902 (1903) (Marcus Island).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 32, 1906 (Tubuai; Nukuhiva; Faté).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1403, 1906 (Upolu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 230, 1905 (1906) (Pago Pago).—Weber: Nova Guinea, vol. 5, pt. 2, p. 249, 1908 (Klipong River, north New Guinea).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 268, 1911 (Vavau, Tonga; Funafuti, Ellice Islands; Fakarava and Makemo, Paumotus; Borabora, Society Islands; Suva, Fiji Islands; Marshalls; Nukuhiva, Marquesas).—McCulloch: Queensland Mus., Mem., vol. 8, pt. 1, p. 70, pl. 11, fig. 2, Jan. 30, 1924 (type of *Caranx moresbyensis*).

Carangus melampygus Streets: U. S. Fish Comm., Bull., vol. 7, p. 69, 1877 (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 192, 1903 (1905) (Honolulu; Samoa).

Caranx caeruleopinnatus (non Rüppell) Cuvier: Hist. nat. Poiss., p. 90, 1833 (New Guinea).

Caranx punctatus (non Agassiz) (Quoy and Gaimard) Cuvier: Hist. nat. Poiss., p. 90, 1833 (name in text).

Caranx stellatus Eydoux and Souleyet: Voyage "Bonite," Zool., vol. 1, p. 167, pl. 3, fig. 2, 1841 (type loc., Hawaiian islands).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 40, Dec., 1922 (Honolulu).—Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., 4th ser., vol. 16, p. 655, November 14, 1927 (Honolulu).

Caranx moresbyensis Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 358, 1882 (type loc., New Guinea).

Caranx lugubris (non Poey) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 321, 1906 (Rarotonga; Shortland Island; Tahiti; Nukuhiva).

Head 3 1/3 to 3 1/2; depth 2 2/3 to 3; D. I, VIII-I, 21 to 23; A. II-I, 19; scales 55 + 37 to 40, of which last 3 on caudal base; snout 2 3/5 to 2 4/5 in head measured from upper jaw tip; eye 4 2/3 to 6 1/4; maxillary 2 1/3; interorbital 3 1/3 to 3 7/8.

Body elongate, rather oblong. Head width 2 1/10 to 2 1/4 in total head. Snout compressed, width 1 1/5 its length. Eye with hind pupil edge very slightly advanced in middle of head length; adipose-lid covers hind third of eye. Mouth moderately inclined, lower jaw slightly protrudes. Maxillary to front pupil edge; expansion 1 1/3 in eye. Teeth conic, in single row in each jaw, though upper with row or narrow band of minute inner teeth. Villiform teeth on vomer, palatines and tongue. Nostrils together, at last fifth in snout. Interorbital convex, elevated, with median keel from above nostrils to occiput moderately convex. Gill rakers 7 + 18, lanceolate, 1 1/4 in eye; gill filaments 7/8 of gill rakers. Scales simple, cycloid, circuli 17 to 47. Curve of lateral line 1 1/2 in straight section; scute width 1 2/5 in eye. Fourth erect dorsal spine 2 3/5 in head; soft dorsal inserted midway between front pupil edge and caudal base, first branched ray 1 3/5; first branched anal ray about 1 2/5; pectoral reaches about seventh branched anal ray base or eye diameter longer than head; ventral 2 2/5 in head. Brownish, whitish below. Fins pale. No opercular spot.

One obtained by the Wilkes Expedition, without locality, but likely from Polynesia, 210 mm. One from New Guinea, 1 Fanning Islands, 5 Honolulu, series from the Society Islands, 4 Papeete, 17 Nukuhiva, 2 Borabora, 1 Makemo, series from Fiji, 1 Suva, series from Ellice Islands, 1 Funafuti, 1 Marshall Islands, 1 Bonin Islands, 14 Vavau, Samoa 2 from Lord Lilford and 2 from C. H. White, 5 Apia from W. H. Jones. All in the National Museum. In the Bishop Museum 4 from Honolulu, 1 French Frigates Shoal, 4 Johnston Island, 14 Guam, 1 Marcus Island, 1 Tahiti, 4 Faté, 2 Shortland Island, 5 Nukuhiva, 1 Rarotonga, 3 Tubuai. I examined over 800 specimens in the Honolulu markets during November and December, 1922, and January, 1923. In the Agassiz Museum 10 Hawaiian specimens from Andrew Garrett, 2 Apiang in the Gilbert Islands, 1 each from the Society Islands, Tahiti and Carolines.

Tropical Atlantic and Indo-Pacific, Mauritius to the East Indies, Tahiti and Hawaii.

Caranx carangoides (Bleeker).

Leioglossus carangoides Bleeker: Nat. Tijds. Ned. Ind., vol. 1, p. 367, 1850 (type loc., Batavia; Siboga, western Sumatra).—Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).

Caranx lioglossus Günther: Cat. fishes Brit. Mus., vol. 2, p. 432, 1860 (on Bleeker).

Head 4; depth 2 1/2 to 3; D. VIII-I, 21; A. II-I, 17; scutes 25; lower jaw longer than upper; maxillary reaches below middle of eye; jaw teeth uniserial, inconspicuous; teeth on vomer and palatines, none on tongue; breast naked; lateral line strongly bent, becomes straight before vertical from middle of dorsal. Caudal with hind margin black. (Bleeker)

East Indies.

Caranx cheilio (Snyder) (Pl. XII, *C*).

Carangus cheilio Snyder: U. S. Fish Comm., Bull., vol. 22, p. 524, pl. 8, fig. 14, 1902 (1904) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 196, 1903 (1905) (copied).

Caranx cheilio Regan: Zool. Soc. London, Proc., p. 370, 1913 (Easter Island).—Fuentes: Mus. Nacional Chile, Bolet., vol. 7, no. 1, p. 300, pl. 16, 1914 (Easter Island).—Nichols: Am. Mus. Novit., no. 50, p. 2, Oct. 24, 1922 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 12, 1925 (Laysan).

Uraspis cheilio Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 40, Dec., 1922 (Honolulu).

Caranx guara (non Bonnaterre?) Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 99, 1912 (Easter Island).

Head 3 1/3; depth 2 4/5; D. I, VIII-I, 24; A. II-I, 20; scales 73 + 38, of which last 5 on caudal base; snout 2 2/3 in head; eye 6 1/6; maxillary 2 3/4; interorbital 3 1/2.

Head width 2 1/3 in its length. Snout conic, upper profile slightly concave above nostrils; width 1 1/3 its length. Maxillary not quite reaching eye. Gill rakers 14 + 27, lanceolate, little longer than gill filaments or 1 1/3 in eye. Breast scaled. Lateral line with straight section about 1 3/4 its upper curved section. Pectoral reaches slightly beyond ventral origin, slightly longer than head, not reaching straight section of lateral line. Brownish generally, sides and below whitish, fins uniform. Dusky blotch on upper hind opercle edge, half diameter of eye.

One in the Bishop Museum 392 mm. long, from the Honolulu market. Also 1 from Laysan in 1923. I examined 21 specimens in the Honolulu markets as follows: 5 November 11, 1922, 5 November 25, 1 December 19, 4 December 22, 5 December 28, and 1 January 6, 1923. One obtained by the Wilkes Expedition, 515 mm., without locality is doubtless Hawaiian, now in the National Museum. Also type of *Carangus cheilio*, obtained in the Honolulu market in 1902.

Possibly not distinct from *Caranx guara*.

Caranx dasson Jordan and Snyder.

Caranx dasson Jordon and Snyder: (U. S.) Bur. Fish., Bull., vol. 26, p. 210, fig. 2, 1906 (1907) (type loc., Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 12, 1925 (Johnston Island and French Frigates Shoal).

Head 3 2/5; depth 3; D. VIII-I, 23; A. II-I, 21; scales 60 + 32 in lateral line, of which last 5 on caudal base; snout 2 4/5 in head; eye 4 3/5; maxillary 3 1/3; interorbital 3 1/5. Predorsal median keel extends nearly to nostrils. Head width half its length. Maxillary extends slightly beyond front eye edge. Gill rakers 9 + 21, lanceolate, slightly longer than gill filaments or

1 4/5 in eye. Breast scaled. Straight section of lateral line 1 2/3 in curved section. Pectoral longer than head by eye diameter, reaches little beyond front of soft dorsal origin, though not to straight section of lateral line. Olivaceous-brown on back, sides and below whitish. No dark opercular spot. Spinous dorsal slightly dusky terminally. Soft dorsal with broad dusky submarginal longitudinal band, blackish on first rays, base pale and edge narrowly whitish. Anal similar, except colors reversed. Pectoral, ventral and caudal pale.

One in the Bishop Museum from Honolulu, 418 mm. One from Johnston Island and 1 from French Frigates Shoal in 1923. I also found 3 specimens one on each date given below, in the Honolulu markets: December 19 and 21, 1922, and January 6, 1923. Type in the National Museum, obtained in Honolulu in 1909.

Jordan and Snyder do not indicate the pale or whitish edges to the soft dorsal and anal seen in my examples.

Caranx elacate (Jordan and Evermann) (Pl. XIII, *A*).

Carangus elacate Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 177, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 190, pl. 31, 1903 (1905) (type).

Caranx thompsoni (Seale) Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 535, 1903 (1905) (type loc., Hawaiian islands).—Jordan and Seale: (U. S.) Bur. Fish., vol. 25, p. 230, 1905 (1906) (Hawaii).—Jordan and Snyder: op. cit., vol. 26, p. 210, 1906 (1907) ("this is a manuscript name only and should have been suppressed").

Head 3 1/2; depth 3 1/2; D. VIII-I, 21, 1; A. II-I, 16, 1; P. 11, 19; V. I, 5; scutes, in straight section of lateral line 31; snout 3 3/4 in head from upper jaw tip; eye 5 4/5; maxillary 2; interorbital 2 4/5.

Body well compressed, fusiform. Caudal peduncle well depressed; least depth about 2/5 its width or 3 1/2 its length; least depth 9 1/4 in head. Head well compressed, upper profile little more inclined, width half its length. Snout profile slightly concave, length 4/5 its width. Eye slightly before middle in head length, 1 1/2 in snout; adipose lid only on last third of eye, transparent and extends back over postocular space equal eye diameter. Maxillary reaches opposite hind eye edge; expansion 1 1/5 in eye. Teeth above with outer enlarged row and narrow band of inner villiform; lower teeth uniserial; small patch of villiform vomerine and palatine teeth; broad patch of villiform teeth on tongue, indistinctly as 3 areas with median largest. Tongue free in front. Nostrils 2 vertical slits, very close together, about last fourth in snout. Interorbital evenly convex. Preorbital and suborbital about evenly wide or 2/3 of eye. Gill opening forward about midway in snout. Gill rakers IV, 2 + 16, lanceolate, 7/8 of gill filaments or 1 3/5 in eye. Curve of lateral line 1 2/3 in straight section; scutes along side of caudal peduncle very much longer longitudinally than vertically. Breast and belly covered with fine scales, also cheek and postocular, those on occiput with more or less imbedded appearance. Scales cycloid; circuli 77 to 80 series.

Spinous dorsal low, first spine very close to second, only about 1/3 its length; last spine free from others; second spine 5 2/5 in head. Soft dorsal with triangular lobe in front; first branched dorsal ray 1 7/8. Anal like soft dorsal, first branched ray 2. Anal spines small and close together. Caudal widely forked, slender lobes pointed, upper 1 2/5 in head. Pectoral falcate, reaches opposite first anal ray base, or slightly beyond straight part of lateral line, half an eye diameter longer than head. Ventral inserted slightly before pectoral origin, 4/5 to anal, 2 2/5 in head. Vent midway between ventral and soft anal origins.

When fresh dusky-olive generally, becoming deep neutral-olive on vertical fins, especially soft dorsal, anal and caudal. Soft dorsal and caudal edges rather broadly and obscurely blackish. Apex of soft dorsal lobe white, forming strong contrast. Edge of soft dorsal very narrowly whitish. Spinous dorsal and pectoral slaty grayish, latter with pale olive tints. Scutes in lateral line blackish, but become whitish as pigment rubs off. Ventral grayish-white, with slight olivaceous tint on first 2 rays, edges of fin whitish. Mandible grayish, under surface of head whitish, like belly and abdomen below, though latter with slight brassy tinge and same on side of head. Iris dusky, adipose eyelid clearly transparent. Inside gill opening and mouth, except dusky border just inside mandibular teeth, all pale. Small black spot, about 1/4 of pupil in extent, on upper margin of gill opening basally.

Described above from a specimen obtained in the Honolulu market, November 15, 1922, now in the Bishop Museum, 811 mm. long. The type of *Caranx thompsoni* formerly in the Bishop Museum is apparently lost, though the cast still extant is 848 mm. long. An examination of this shows that this nominal form is undoubtedly *Caranx elacate*. It shows the lower jaw strongly protruding. Adipose-eyelid very conspicuous behind, pale yellowish area sharply defined against dark color of head. Head and fins brownish-black, latter with slate-gray tint. Body bluish-gray with soiled obscure tints, scales darker. Pectoral and ventral little more grayish than other fins. No trace of dark opercular spot.

In the Honolulu market I found the following in 1922: 1 about 558 mm. long November 25, 5 large specimens December 13 and an adult December 15. J. W. Thompson reports only about a dozen have come to his notice since 1903.

Type of *Carangus elacate* from Hawaii, in the National Museum.

Caranx helvolus (Schneider) (Pl. XIII, *B*).

Scomber helvolus (Forster) Schneider: Systema ichth., Bloch, p. 38, 1801 (type loc., Ascension Island, Atlantic Ocean [Pacific?]).

Caranx helvolus Günther: Cat. fishes Brit. Mus., vol. 2, p. 443, 1862 (type).—Fowler: B. P. Bishop Mus., Bull. 22, p. 25, 1925 (Honolulu).

Carangus helvolus Snyder: U. S. Fish Comm., Bull., vol. 22, p. 524, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 196, pl. 32, 1903 (1905) (Honolulu).

Leucoglossa candens (Jordan, Evermann, Wakiya) Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., 4th ser., vol. 16, p. 660, November 14, 1927 (on Snyder's example; Honolulu specimen 268 mm.).

Leucoglossa albilinguis (Jordan, Evermann, Wakiya) Jordan, Evermann, Tanaka: op. cit., 4th ser., vol. 16, p. 661, pl. 22, fig. 2 (type loc., Honolulu).

Head 3 3/5; depth 2 3/4; D. V. II, 27; A. II-I, 23; scales 56+40, of which last 13 on caudal base; snout 3 in head measured from upper jaw tip; eye 4 1/2; maxillary 2 1/4; interorbital 3. Gill rakers 7+15, lanceolate, equal gill filaments or 1 2/5 in eye. Lateral line curve slight, not quite equal to straight section. Scales with 56 circuli. Breast naked. Pectoral slightly longer than head, reaches straight section of lateral line.

Dusky, with bronze tinge in life. Inside gill opening and pharynx blackish, tongue and front of each jaw inside white. Iris slaty. Fins dark.

One from Honolulu in the Bishop Museum, 418 mm. long. Another was collected December 15, 1922. J. W. Thompson reports about 100 seen during the past 20 years.

Readily distinguished by the white inside of the mouth.

Jordan, Evermann and Tanaka have separated *Uraspis* Bleeker on the structure of the scutes of the lateral line, in which they are said to have the tip of each scute with a blunt spine directed forward. *Leucoglossa* is then proposed as a new genus with *L. candens* and *L. albilinguis*. The first is based on Snyder's specimen of *Caranx helvolus* in the National Museum which is 380 mm. long and a paratype from Honolulu 268 mm. Possibly these may represent a distinct species, with the posterior directed scutes of the straight section of the lateral line of some value though the other alleged differences are hardly apparent. It is not clear that even the first "character unique in Carangidae" is not unreliably variable or a condition of age. It is likely these specimens merely represent nominal forms at present and are in no sense established species.

Caranx uraspis Günther.

Caranx uraspis Günther: Cat. fishes Brit. Mus., vol. 2, p. 444, 1860 (on Bleeker).

Uraspis carangoides (non *Leioglossus carangoides* Bleeker 1850) Bleeker: Nat. Tijds. Ned. Ind., vol. 8, p. 418, 1855 (type loc., Amboina).

Uraspis reversa (Jordan, Evermann, Wakiya) Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., 4th ser., vol. 16, p. 658, pl. 22, fig. 1, November 14, 1927 (type loc., Honolulu).

Head 4, obtuse, convex, frontal profile convex; depth 2 3/4; D. VIII-I, 28; A. II-I, 21; eye 2 2/5 in head. Body oblong, compressed, dorsal profile strongly convex. Maxillary reaches nearly midway in eye. Teeth biserial above, uniserial below. Scales very small, little evident. Breast naked. Lateral line curves moderately to middle of soft dorsal, spiniferous scutes small, 32 in number. Dorsal spines half of soft rays. Soft dorsal and anal with acute front angle. Caudal deeply emarginate, 4 1/2 in body. Pectoral 4 or less, falcate. Ventral 5 2/5, obtusely rounded. Pale green, below silvery. Five deep gray transverse bands. Inside mouth black, tongue white. Dorsal and anal rays yellow, ends white, fins densely dotted with dark gray. Caudal yellowish basally, posteriorly dark gray. Pectoral hyaline yellowish. Ventral yellowish, densely dotted with dark gray. Length 129 mm. (Bleeker)

Caranx ignobilis (Forskål).

Scomber ignobilis Forskål: Descriptiones animalium, pp. 12, 55, 1775 (type loc., Djedda and Lohaja, Red Sea).

Caranx ignobilis Steindachner: Akad. Wiss. Wien, Denks., vol. 70, p. 495, 1901 (Honolulu; Laysan).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 231, 1905 (1906) (Samoa).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 354, 1906 (Tahiti).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 269, 1911 (Nukuhiva, Marquesas Islands).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 39, Dec., 1922 (note).—Fowler: B. P. Bishop Mus., Bull. 22, p. 8, 1925 (Guam).

Carangus ignobilis Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 188, 1903 (1905) (Honolulu).

Carangus hippos (non Linné) Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).

Caranx hippos Peters: Akad. Wiss. Berlin, Monatsb., p. 836, 1876 (1877) (New Britain).—Waite: Australian Mus., Records, vol. 5, p. 3, 1903 (Nauru, Pleasant Island, Marshalls; Aaanopa, Ocean Island, Gilbert Group).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 133, 1913 (Waigiu).

Carangus hippoides Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 443, fig. 15, 1902 (1903) (type loc., Honolulu).

Caranx melampygus (non Cuvier) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 32, 1906 (smaller Shortland Island specimen).

Head 3 2/5; depth 2 3/4; D. I, VII-I, 20; A. II-I, 17; scales 48+30, of which last 4 on caudal base; snout 2 7/8 in head measured from upper jaw tip; eye 6; maxillary 2; interorbital 3 2/5. Gill rakers VI, +12, II, lanceolate, slightly longer than gill filaments or 1 1/4 in eye. Pectoral reaches third scute of lateral line, 2 1/8 to caudal base; curve of lateral line very slightly shorter than straight section; breast naked, except patch of small scales before ventral. Color pale brown. Dusky blotch in pectoral axil. No dark opercular spot.

In the National Museum one Hawaiian and another labeled "probably Pacific" obtained by the Wilkes Expedition. These 145 to 200 mm. long. Also the type of *Carangus hippoides*, 3 Hawaiian specimens and 2 Nukuhiva from the Bureau of Fisheries. In the Bishop Museum one 671 mm. and 2 small ones from Honolulu and 1 from Shortland Island. I examined 1032 specimens in the Honolulu markets in November and December, 1922, and January, 1923. In the Agassiz Museum 4 Hawaiian specimens.

Jouan describes incompletely *Caranx* No. 81, a specimen 250 to 500 mm. from Uitoe, New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 295, 1861). It may be intended for this species. Said to be silvery, abdomen and fins bright canary-yellow. The same author also more briefly notices another *Caranx*, No. 79, from Kanala, which is 100 mm. long (op. cit., p. 293). It is unidentifiable.

Widely distributed from East Africa to the East Indies and Hawaii.

Caranx kalla Cuvier.

Caranx kalla Cuvier: Hist. nat. Poiss., vol. 9, p. 37, 1833 (type loc., Malabar; Mahe; Red Sea).

Caranx calla Macleay: Linn. Soc. New South Wales, Proc., vol. 4, p. 63, 1879 (Solomons).

Known by the ovoid body tapering into rather slender tail, curve of lateral line 1 3/4 in its straight section and large dark opercular blotch nearly large as eye. Length 200 mm.

Caranx parasitus Garman (Mus. Comp. Zool., Bull., vol. 39, pt. 8, p. 232, 1903, type loc., Cairns, Barrier Reef, Australia) is closely related and possibly identical.

Red Sea and East Africa to the East Indies and Solomons.

Caranx lugubris Poey (Pl. XIII, *C*).

Caranx lugubris Poey: Hist. nat. Cuba, Mem., vol. 2, p. 222, 1861 (type loc., Cuba).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 378, 1923 (Honolulu).

Caranx tenebrosus (Jordan, Evermann, Wakiya) Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., 4th ser., vol. 16, p. 656, Nov. 14, 1927 (type loc., Sulphur Bay, Clarion Island, Revillagigedo Group; Honolulu).

Head (mandible tip damaged) 3 1/6; depth 2 1/3; D. VII-I, 20; A. II-I, 17; scales 50+29, last 3 on caudal base; snout 3 in head from upper jaw tip; eye 6; maxillary 2 1/6; interorbital 3 3/5. Breast scaled. Curve of lateral line 1 2/5 in straight section. Pectoral reaches eleventh scute of lateral line, 1 4/5 to caudal base. Color very dark or dusky, but no distinct opercular spot.

The above in the Bishop Museum, from the Honolulu market, is 761 mm. long. It is abnormal, with the mandible included in the upper jaw. I found about 20 others in the Honolulu markets, in November and December, 1922, and January, 1923. All of these had the mandible protruding beyond the upper jaw.

Caranx sexfasciatus Quoy and Gaimard.

Caranx sexfasciatus Quoy and Gaimard: Voyage "Uranie," Zool., p. 358, pl. 65, fig. 4, 1825 (type loc., "Iles des Papous").—Cuvier: Hist. nat. Poiss., vol. 9, p. 83, 1833 (Waigiu; Vanicolo).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 74 1900 (1901) (Guam).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 231, 1905 (1906) (Gaasegase River at Apia; Vailele, Upolu).—Evermann and Seale: Copeia, no. 119, p. 70, June 16, 1923 (Apia, Samoa).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 25, 32, 1925 (Honolulu; Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 12, 1925 (Laysan).—Fowler: op. cit., Bull. 38, p. 12, 1927 (Washington, Christmas and Baker islands).

Caranx lessonii (Cuvier) Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 155, pl. 31, fig. 1, 1830 (type loc., New Guinea).

Caranx forsteri Cuvier: Hist. nat. Poiss., vol. 9, p. 81, 1833 (type loc., Mauritius; Malabar; Celebes; New Guinea; New Ireland; Vanicolo; East Indies).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 30, 1906 (Tahiti).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1403, 1906 (Upolu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 230, 1905 (1906) (Pago Pago; Apia).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 610, 1908 (Suva, Fiji).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 268, 1911 (Taritari, Gilberts; Funafuti, Ellice Islands; Marshalls).—Fowler; Copeia, no. 112, p. 82, Nov. 20, 1922 (Hawaii).

Carangus forsteri Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 191, 1903 (1905) (Honolulu, Hilo, Waialua; Hanalei and Puako bays).

Caranx peronii Cuvier: Hist. nat. Poiss., vol. 9, p. 84, 1833 (type loc., Vanicolo; Amboina; Java; Malabar; East Indies).

Scomber hippos (non Linné) Lichtenstein: Descriptiones animalium, Forster, pp. 155, 199, 1844 (tropical Pacific, Tahiti).

Caranx hippos Günther: Cat. fishes Brit. Mus., vol. 2, p. 449, 1860 (Tanna).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 131, pl. 84, 1876 (Samoa; Tanna; Tahiti).—Peters: Akad. Wiss. Berlin, Monatsb., p. 36, 1876 (1877) (New Britain).—Günther: Rept. voyage "Challenger," vol. 1, pt. 6, pp. 58, 59, 1880 (Papeete, Tahiti; Hilo).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 355, 1882 (New Guinea).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 18, p. 206, 1912 (Port Sandwich, New Hebrides).

Caranx puapok Thiollière: Fauna. Woodlark, p. 173, 1857 (type loc., Woodlark Island).

Caranx papuensis Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 325, pl. 10, fig. 3, 1876 (type loc., Hall Sound, British New Guinea).—McCulloch: Queensland Mus., Mem., vol. 8, pt. 1, p. 69, pl. 13, Jan. 30, 1924 (type: Solomon Islands).

Caranx carangus (non Bloch ?) Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 356, 1882 (New Guinea).—Regan: Zool. Soc. London, Trans., vol. 20, pt. 6, p. 276, 1914 (Mimika River, New Guinea).

Caranx chrysos (non Bloch) Streets: U. S. Nat. Mus., Bull., vol. 7, p. 70, 1877 (Honolulu).

Caranx latus (non Agassiz) Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 501, 1900 (Honolulu).

Carangus latus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 444, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 523, 1902 (1904) (Hanalei Bay, Kauai, Puako Bay, Hawaii).

Carangus marginatus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 444, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 191, 1902 (1903) (Honolulu).

Caranx marginatus Fowler: Acad. Nat. Sci. Philadelphia. Proc., p. 81, 1905 (Honolulu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 231, 1905 (1906) (Samoa).

Carangus rhabdotus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 444, fig. 16, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 193, fig. 74, 1903 (1905) (Honolulu).

Caranx melampygus (non Valenciennes) Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 39, Dec. 1922 (Hawaii).

In the National Museum 2 from Fiji, 1 Tahiti and 1 Sulu, all obtained by the Wilkes Expedition. Length 98? to 138 mm. Also the type of *Carangus rhabdotus*, 3 Hanalei, 15 Hawaii, 1 Gilbert Islands, 3 Marshall Islands, 8 Apia, 2 Tari Tari, 2 Funafuti. The Bishop Museum has 12 Honolulu specimens; 2 from Laie Stream on Oahu in November, 1922, from C. Montague Cooke, Jr. and III; 1 Agaña on Guam; 2 Tahiti. Largest 300 mm. The Agassiz Museum has 1 from Strong Island, Caroline Islands, obtained by Rev. B. G. Snow; 4 young from Funafuti, Ellice Islands; 2 young from Apiang, Gilbert Islands, August, 1860; 8 young from Society Islands obtained by Andrew Garrett. The Academy has 2 from Honolulu and 1 from Apia.

In the Honolulu markets I examined 815 specimens in November and December, 1922, and January, 1923. One at Waikiki October 29, 1922.

An abundant species throughout the Indo-Pacific region.

Gnathanodon speciosus (Forskål) (Pl. XI, *C*).

Scomber speciosus Forskål: Descriptiones animalium, p. 12, 1775 (type loc., Arabia).

Gnathanodon speciosus Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 41, Dec., 1922 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 25, 1925 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 38, p. 12, 1927 (Honolulu).

Caranx speciosus Günther: Rept. voyage "Challenger," vol. 1, p. 35, 1880 (Levuka, Fiji).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 365, 1882 (New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol.

1, no. 5, pp. 16, 20, 1902 (Honolulu).—Jenkins; U. S. Fish Comm., Bull., vol. 22, p. 447, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 525, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 197, pl. 12, 1903 (1905) (Honolulu.)—Jordan and Seale: (U. S.) Bur. Fisher., Bull., vol. 25, p. 232, 1905 (1906) (Pago Pago).

Caranx (*Hypocaranx*) *specious* Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 493, 1901 (Pearl Harbor, Oahu).

Caranx edentulus Jouan: Soc. Cherbourg, Mem., vol. 21, p. 333, 1877-78 (on *Caranx* Jouan: op. cit., vol. 8, p. 295, 1861, type loc., Uitoë, New Caledonia).

Caranx obtusiceps Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 357, 1883 (type loc., New Guinea).

Caranx regularis Garman: Mus. Comp. Zol., Bull., vol. 39, pt. 8, p. 232, 1903 (type loc., Suva, Fiji).

Six in the Bishop Museum from Honolulu, largest 240 mm. One in the Honolulu market December 15, 1922. In the National Museum 2 from Honolulu, 1 from Apia, and 3 from New Guinea. Largest 272 mm. Type of *Caranx regularis* from Suva, in the Agassiz Museum. It is very young with 5 broad vertical bands of black to middle of sides, last reflected on bases of caudal rays.

East Africa to the East Indies and Hawaii.

Gnathanodon leptolepis (Cuvier).

Caranx leptolepis (Kuhl and Van Hasselt) Cuvier: Hist. nat. Poiss., vol. 9, p. 48, 1833 (type loc., Java).—McCulloch: Queensland Mus., Mem., vol. 8, pt. 1, p. 72, fig. 5, Jan. 30, 1924 (type of *Caranx cheverti*) fig. 6 (type of *Caranx procaranx*).

Caranx cheverti Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 324, pl. 10, fig. 1, 1877 (type loc., Katow, New Guinea).

Head 3 2/5; depth 2 4/5 to 2 9/10; D. VIII-I, 23 to 25; A. II-I, 22 or 23; scutes 23 to 25; eye long as or longer than snout, 3 to 3 1/10 in head; teeth few and microscopic in jaws, none on palate; adipose eyelid broad. Dark shoulder blotch extends over end of opercle. Length 80 to 138 mm. (McCulloch)

Differs from *Gnathanodon speciosus* in color. According to Day it is silvery, with a broad golden stripe from above the eye to the upper edge of the tail.

India and East Indies.

Carangoides ferdau (Forskål).

Scomber ferdau Forskål: Descriptiones animalium, pp. 12, 55, 1775 (type loc., Djedda, Red Sea).

Caranx ferdau Schmeltz: Mus. Godeffroy, Cat. 4, p. 17, 1869 (Fiji).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 134, pls. 87-88, 1876 (Tahiti, Bonin Islands, Hawaii).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 495, 1900 (Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, pt. 5, p. 21, 1902 (Honolulu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 232, 1905 (1906) (Samoa).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 269, 1911 (Makemo, Paumotus).

Carangoides ferdau Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 446, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 198, fig. 77, 1903 (1905) (Honolulu, Kailua, Samoa).—Fowler: B. P. Bishop Mus., Bull. 22, p. 8, 1925 (Guam).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 12, 1925 (Wake Island).

Caranx novae guineae Cuvier: Hist. nat. Poiss., vol. 9, p. 47, 1833 (type loc., New Guinea).

Caranx magog Thiolliere: Fauna Woodlark, p. 174, 1857 (type loc., Woodlark Island).

Caranx laticaudus Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 325, pl. 10, fig. 2, 1875 (type loc., Hall Sound, New Guinea).—McCulloch: Queensland Mus., Mem., vol. 8, pt. 1, p. 74, pl. 12, Jan. 30, 1924 (type).

Caranx gilberti Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 234, fig. 29, 1905 (1906) (type loc., Pago Pago, Samoa).

Carangoides jordani Nichols: Am. Mus. Novit., no. 50, p. 2, Oct. 24, 1922 (type loc., Hawaiian islands).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 40, Dec., 1922 (Honolulu).

Ferdauia jordani Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., 4th ser., vol. 16, p. 662, Nov. 14, 1927 (Honolulu).

Head 3 2/3; depth 2 2/3; D. I, VII-I, 30; A. II-I, 26; scales in lateral line 94+54, of which 6 on caudal base; snout 3 in head measured from upper jaw tip; eye 4 1/5; maxillary 2 3/5; interorbital 3. Least depth of caudal peduncle 6 1/3 in total head length. Head width half its length. Snout long as wide. Maxillary reaches pupil, expansion 1 1/3 in eye. Infraorbital width 1 1/2 in eye. Gill rakers 10+21, lanceolate, long as gill filaments or 1 2/3 in eye. Scales fine, circuli 16 to 20, complete. Breast and chest naked. Lateral line with slight curve, straight section about 1 1/2 in curved section. First dorsal ray 1 1/3 in head; first branched anal ray 1 3/4; lower caudal lobe 1; ventral 2 1/8. Pectoral reaches beyond front ray bases of long soft dorsal and anal lobes, fin 3 1/4 in combined head and trunk. Back pale brown, sides below lateral line silvery white, also iris. Spinous dorsal grayish, front lobe of soft dorsal and anal and most of ventral terminally dusky. Pectoral pale. No dark spot on opercle.

One in the Bishop Museum from Honolulu, 184 mm. Also 1 from Wake Island in 1923. I examined 1065 specimens in the Honolulu markets during November and December, 1922, and January, 1923. Of these the greater number were brought in in late December. In the National Museum 1 Hawaiian and 1 Makemo Pass. Two in the Agassiz Museum from the Society Islands.

East Africa to the East Indies, Hawaii, and Tahiti.

Carangoides gymnostethoides Bleeker.

Carangoides gymnostethoides Bleeker: Nat. Tijds. Ned. Ind., vol. 1, p. 364, 1850 (type loc., Batavia, Java).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 199, 1903 (1905) (Johnston Island).—Fowler: B. P. Bishop Mus., Bull. 22, p. 25, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 12, 1925 (Laysan).

Caranx gymnostethoides Smith and Swain: U. S. Nat. Mus., Proc., vol. 5, p. 125, 1882 (Johnston Island).

Carangoides gymnostethoides evermanni Nichols: Am. Mus. Novit., no. 3, p. 2, fig. 1, Mar. 9, 1921 (type loc., Honolulu market).—Nichols: op. cit., no. 50, p. 3, Oct. 24, 1922 (Honolulu).

Ferdauia evermanni Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., 4th ser., vol. 16, p. 662, pl. 22, fig. 3, Nov. 14, 1927 (Honolulu).

Head 3 2/3; depth 2 1/2; D. VIII-I, 33; A. II-I, 28; scales 83+38 in lateral line, of which last 6 on caudal base; snout 3 in head measured from upper jaw tip; eye 5 1/5; maxillary 2 3/5; interorbital 2 2/3. Head width 1 9/10 in its length. Eye 1 7/8 in snout. Maxil-

lary reaches eye; expansion 1 1/2 in eye. Lower jaw strongly projects. Bands of fine teeth on vomer and palatines and in jaws, outer of latter slightly enlarged. Interorbital convexly elevated. Gill rakers 7+15, v, lanceolate, rather strong, equal filaments or 1 1/2 in eye. Scales very fine, extend down on sides of chest, though median or ventral line of breast naked; about 45 to 51 circuli. Lateral line little arched, straight section about half in curved and falls about opposite middle of dorsal base. First branched dorsal ray 1 1/3 in head; first anal ray 1 2/3. Caudal widely spread, length nearly equals body depth. Pectoral reaches about beginning of straight section of lateral line, slightly less than half of combined head and trunk. Ventral 2 2/5 in head. Uniform brown, paler below. No opercular spot. Soft dorsal and anal lobes tinged with dusky. Pectoral pale brown, axil dusky.

One in the Bishop Museum from Honolulu, 494 mm. Also 1 from Laysan in 1923. I examined 132 specimens in the Honolulu markets in November and December, 1922. One in the National Museum from Johnston Island. Two in the Agassiz Museum from the Society Islands, larger 432 mm.

India, East Indies, Hawaii.

Carangoides oblongus (Cuvier).

Caranx oblongus Cuvier: Hist. nat. Poiss., vol. 9, p. 96, 1833 (type loc., Vanicolo; Oualan).—Peters: Akad. Wiss. Berlin, Monatsb., p. 836, 1876 (1877) (New Britain; Bougainville Island; Solomons).

Somewhat like *Carangoides ferdau* in the elevated soft dorsal and anal lobes, but the soft dorsal rays 21 or 22 and the soft anal rays 18 or 19. Gill rakers 7+18.

India, East Indies, Solomons.

Carangoides ajax Snyder.

Carangoides ajax Snyder: U. S. Fish Comm., Bull., vol. 22, p. 524, pl. 8, fig. 15, 1902 (1904) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 200, 1903 (1905) (type).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 13, 1925 (Laysan).

Distinguished from the other species by the fewer anal rays, about 16 in number. The gill rakers but 14 on lower branch of first arch. In this species the frontal region is somewhat elevated.

I found 14 specimens in the Honolulu markets in 1922, as follows: 5, November 29; 5, November 30; 1, December 22; 3, December 30. Type in the National Museum, obtained in the Honolulu market in 1902.

Reaches upward of a meter in length.

Carangoides armatus (Forskål).

Sciaena armata Forskål: Descriptiones animalium, p. 53, 1775 (type loc., Red Sea).

Caranx armatus Peters: Akad. Wiss. Berlin, Monatsb., p. 836, 1876 (1877) (New Guinea; New Britain).—Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 323, 1876 (New Guinea).

Citula armata Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

Citula citula Cuvier: Hist. nat. Poiss., vol. 9, p. 94, 1833 (type loc., Red Sea; New Guinea).

Citula seriolinus Thiollière: Fauna Woodlark, p. 174, 1857 (type loc., Woodlark Island).

Caranx plumbeus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 233, fig. 28, 1905 (1906) (Apia: Pago Pago).

?Caranx rastrosus Jordan and Snyder: Carnegie Mus., Mem., vol. 4, no. 2, p. 37, pl. 51, 1908 (type loc., Takao and Cavite, Philippines).

Like *Carangoides mandibularis* but with the gill rakers 12+22 and the opercle with a black marginal blotch.

Jouan describes it as *Caranx,* No. 80, from Uitoe, New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 294, 1861). His specimen was 180 mm. long.

Red Sea, East Africa, East Indies and Samoa. Reaches 512 mm.

Carangoides mandibularis (Macleay).

Caranx mandibularis Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 356, 1882 (type loc., New Guinea).

Ulua mandibularis McCulloch: Queensland Mus., Mem., vol. 8, pt. 1, p. 75, pl. 14, Jan. 30, 1924 (types from near Port Moresby).

Known by the extremely long and numerous gill rakers, which project well into the mouth each side of the tongue. Dorsal, anal and pectoral lobes long.

One in the National Museum from New Guinea, 273 mm. long. About 50 gill rakers on lower half of first arch.

Blepharis ciliaris (Bloch).

Zeus ciliaris Bloch: Nat. ausländischen Fische, pt. 3, p. 36, pl. 191, 1787 (type loc., East Indies; Suratte).

Caranx ciliaris Günther: Cruise of "Curacoa," p. 410, 1873 (Solomons).—Schmeltz: Mus. Godeffroy, Cat. 5, pt. 11, p. 27, 1874 (Pelew Islands).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 135, pl. 89, 1876 (Pelew Islands; Kingsmills; Hawaiian islands; Solomons).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 356, 1882 (New Guinea).

Carangus ciliaris Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 17, 1902 (Honolulu).

Alectis ciliaris Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 447, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 525, 1902 (1904) (Honolulu; Hanalei Bay, Kauai).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 942, 1904 (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 200, fig. 78, 1903 (1905) (Honolulu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 235, 1905 (1906) (Apia).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 41, Dec., 1922 (Honolulu).

Blepharis ciliaris Fowler: B. P. Bishop Mus., Bull. 22, p. 8, 1925 (Guam).

Eleven in the Bishop Museum from Honolulu, largest 177 mm. Five Hawaiian specimens in the National Museum and 2 from Tutuila, Samoa, from Lieut. H. C. Kellers. One young from the Hawaiian islands from Andrew Garrett; 1 young, poor, from Oahu; 1 young from Maui obtained by C. F. Winslow; 1 young from Society Islands; 2 young from Ebon Island, Marshall Islands, from Rev. B. G. Snow; all in the Agassiz Museum.

In many ways like *Scyris indica,* only the body greatly deeper or nearly orbicular and the dorsal and anal filaments extremely elongate.

East Africa to the East Indies and Hawaii.

Scyris indica Rüppell.

Scyris indicus (Cuvier) Rüppell: Atlas Reis. Nord. Afrika, Zool., p. 128, pl. 33, fig. 1, 1828 (type loc., Djedda, Red Sea).

Scyris indica Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 378, 1923 (Honolulu).

Alectis indicus Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 41, Dec., 1922 (Honolulu).

Citula gallus (non Linné) Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).

Caranx gallus Schmeltz: Mus. Godeffroy, Cat. 4, p. 17, 1869 (Kandavu).—Schmeltz: op. cit., Cat. 5, p. 27, 1874 (Viti Islands).—Peters: Akad. Wiss. Berlin, Monatsb., p. 836, 1876 (1877) (New Ireland).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 135, 1876 (Hawaiian islands; Society Islands).

Alectis ciliaris (non Bloch) Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 200, 1903 (1905) (part).—Nichols: Am. Mus. Novit., no. 50, p. 3, Oct. 24, 1922 (Honolulu).

Head 3 1/2; depth 2 1/8; D. I, 19; A. I, 16; 36 scutes in straight section of lateral line, which equals curved section; snout 2 3/5 in head measured from upper jaw tip; eye 4 2/5; maxillary 2 1/2; interorbital 3 1/8.

Body elongately ovoid, strongly compressed. Least depth of caudal peduncle 7 1/5 in total head length. Head width 2 2/5 in its length, upper profile rather evenly convex. Snout compressed, width 1 1/3 its length. Eye with adipose-lid most developed forward above and posteriorly. Mandible 2 1/3 in head, projects. Maxillary nearly reaches opposite pupil. Bands of fine teeth in jaws, on vomer, palatines and tongue. Nostrils together, close before eye, posterior larger. Interorbital elevated to median keel. Gill rakers III, 2+13, II, lanceolate, 1 4/5 in gill filaments, which 1 1/3 in eye. Scales vestigeal, little developed. Soft dorsal with first 4 rays filamentous, of which 2 nearly equal combined head and trunk, extend well beyond caudal, first subequal and others shorter. Anal with first ray extended in long filament at least far as caudal tips. Caudal forked, 1 1/4 in head. Pectoral reaches straight section of lateral line. Ventral extends half way to anal, 2 1/10 in head.

Largely silvery-white, with glaucous to bluish-gray on back, latter also with pale bluish to purplish reflections. Iris white. Upper edge of gill opening broadly blackish along space at least nearly equal to snout length. Fins all more or less grayish, with dorsal and anal filaments neutral-blackish. Mandible tip neutral-blackish.

One in the Bishop Museum, obtained November 27, 1922, at Honolulu, 762 mm. long. One in the National Museum from New Guinea.

Only known previously from Hawaii by Andrew Garrett's record, published by Günther. The species is seen occasionally in the markets of Honolulu. I found 18 specimens during November and December, 1922, usually only one each day. According to Day, said to reach 1525 mm.

Red Sea to the East Indies and Hawaii.

Trachinotus ovatus (Linné).

Gasterosteus ovatus Linné: Systema nat., 10th ed., p. 296, 1758 (type loc., Asia).

Trachynotus ovatus Günther: Cat. fishes Brit. Mus., vol. 2, p. 481, 1860 (Aneiteum).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 17, 1869 (Samoa).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 139, 1876 (Samoa).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 359, 1882 (New Guinea).

Trachinotus ovatus Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 271, 1911 (Vavau, Tonga).—Fowler: B. P. Bishop Mus., Bull. 22, p. 8, 1925 (Guam).

Dorsal and anal lobes moderate, frontal region convex, ventrals short.

The National Museum has 2 from Samoa? and 2 without locality, though likely from Oceania, obtained by the Wilkes Expedition. Length 150 mm. Also a specimen through the Bureau of Fisheries from Apia and another from Vavau.

Red Sea, East Africa to the East Indies and Samoa. Reaches 500 mm.

Trachinotus oblongus Cuvier.

Trachinotus oblongus Cuvier: Hist. nat. Poiss., vol. 8, p. 321, 1831 (type loc., Java; Pondicherry).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 272, pl. 1, 1911 (Nukuhiva, Marquesas Islands).

Ventrals, dorsal and anal lobes short, muzzle rather sharp, eye large and short maxillary reaches eye.

Four in the National Museum from Nukuhiva.

India, East Indies, Marquesas Islands.

Trachinotus botla (Shaw).

Scomber botla Shaw: Gen. Zool., vol. 4, p. 591, 1803 (no type locality). (On *Botla parrah* Russell: Fishes of Coromandel, vol. 2, p. 32, pl. 142, 1803, type loc., Vizagapatam).

Trachinotus moralii Thiollière: Fauna Woodlark, p. 176, 1857 (type loc., Woodlark Island).

Seriola morali (Montrouzier) Thiollière: Fauna Woodlark, p. 176, 1857 (name in synonymy).

Trachinotus rhomboides Jouan: Soc. Cherbourg, Mem., vol. 21, p. 334, 1877-78 (on Jouan, op. cit., vol. 8, pp. 260, 261, 1861, Uitoč, New Caledonia).

Trachynotus coppingeri Günther: Rept. voyage "Alert," p. 29, pl. 3, fig. a, 1884 (type loc., Percy Island, Cloudy Bay, New Guinea).

Like *T. oblongus*, only the maxillary reaches opposite eye center. Row of 3 to 5 large dark rounded blotches along and above lateral line.

East Indian region.

Trachinotus baillonii (Lacépède).

Caesiomorus baillonii Lacépède: Hist. nat. Poiss., vol. 3, pp. 92, 93, pl. 3, fig. 1, 1802 (no type locality).

Tachynotus bailloni Günther: Cat. fishes Brit. Mus., vol. 2, p. 484, 1860 (Tanna).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 139, 1876 (Society Islands; Apia; New Hebrides).—Peters: Akad. Wiss. Berlin, Monatsb., p. 836, 1876 (1877) (New Britain).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 359, 1882 (New Guinea).

Trachinotus baillonii Waite: Australian Mus., Mem., no. 3, p. 190, 1897 (Funafuti, Ellice Islands).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 271, pl. 2, fig. 1, 1911 (Funafuti).—Nichols: Am. Mus. Novit., no. 94, p. 3, Oct. 19, 1923 (Mangareva).—Fowler: B. P. Bishop Mus., Bull. 38, p. 12, 1927 (Malden and Christmas islands).

Dorsal and anal lobes long, also ventrals. Snout blunt. Eye small. Maxillary reaches front of pupil.

Three from Funafuti and 4 from the Bonin Islands in the National Museum, largest 203 mm. All but young with 2 dark lateral spots on lateral line little smaller than pupil. Young with longer maxillary. Two from Funafuti and 2 from the Society Islands in the Agassiz Museum, largest about 405 mm.

Jouan notices imperfectly as *Acanthinion* No. 34 a specimen 300 mm. long from Uitoe, New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 261, 1861) likely this species. D. 26; A. 25; V. 3. Front of dorsal and anal falciform, that of

anal longer than dorsal and both reach caudal base. Caudal very forked, lobes equal and long. Bluish on back, silvery-white on flanks.

Jouan says except for the spots it resembles *Acanthinion trimaculatus* Cuvier.

Red Sea and East Indies to the Society Islands. Reaches 500 mm.

LACTARIIDAE

Lactarius lactarius (Schneider).

Scomber lactarius Schneider: Systema ichth., Bloch, p. 31, 1801 (type loc., Tranquebar).

Lactarius delicatulus Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).

D. VII or VIII, 1, 21 or 22; A. III, 25 to 28; scales 74 to 80. Leaden above, silvery-white below. Black spot on upper hind edge of opercle. Reaches 253 mm.

East Indies, China.

LEIOGNATHIDAE

Leiognathus equula (Forskål).

Scomber equula Forskål: Descriptiones animalium, pp. 12, 58, 1775 (type loc., Arabia).

Equula caballa Valenciennes: Hist. nat. Poiss., vol. 10, p. 53, 1835 (Guam).—Castelnau: Zool. Soc. Victoria, Proc., vol. 2, p. 114, 1873 (Noumea, New Caledonia).

Leiognathus splendens Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 274, 1911 (Suva, Fiji).

Equula edentula Macleay: Linn. Soc. New South Wales, Proc., vol. 4, p. 63, 1879 (Solomons).—Macleay: op. cit., p. 266, 1883 (Normanby Island, New Guinea).—Steindachner: Akad. Wiss. Wein, Sitz., vol. 115, pt. 1, p. 1383, 1906 (Upolu).

Leiognathus edentulus Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 610, 1908 (Suva, Fiji).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 274, 1911 (Suva).—Fowler: B. P. Bishop Mus., Bull. 22, p. 10, 1925 (Guam).

Leiognathus obscura Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 74, 1900 (type loc., Guam).

Head 3 1/8; depth 1 2/3 to 1 3/4; D. VIII, 16, 1; A. III, 14, 1; scales 88 close along lateral line to caudal base and 6 more on latter; tubes 55 to 59 in lateral line to caudal base and 3 or 4 more on latter; 20 to 22 scales above lateral line, 36 below; 12 to 15 predorsal scales to occipital process; snout 2 5/6 to 3 1/3 in head; eye 2 3/4 to 3; maxillary 2 1/3; interorbital 2 3/4. Least depth of caudal peduncle 4 to 4 1/6 in head; head width 2. Second dorsal spine 1 1/10 in head; first dorsal ray 3 3/4 to 4 4/5; second anal spine 1 3/5 to 1 3/4; first anal ray 3 1/3 to 4; caudal 1; pectoral 1 1/4 to 1 2/5; ventral 1 3/4 to 2.

The Bishop Museum has the type and 2 paratypes of *Leiognathus obscura,* 100 to 142 mm., from Agaña, Guam. These noted above. In the National Museum 1 from Fiji, obtained by the Wilkes Expedition, 6 from Suva secured by the *Albatross* of which 5 as *Leiognathus edentulus* and 1 as *Leiognathus splendens.* Also 1 from New Guinea 205 mm. long, with depth 1 3/5 and no black on spinous dorsal. In the Agassiz Museum a half-grown specimen from Suva and 1 specimen 183 mm. long from Ebon Island, Marshall Islands, collected by Rev. B. G. Snow.

According to Klunzinger, who separates *Scomber edentulus* Bloch as *Leiognathus edentulus,* or a variety of *Leiognathus equula,* the first differs in a longer body or the depth 2 1/3 to 2 1/2 with the caudal, while in *Leiognathus equula* the depth is 2. In both the end of the spinous dorsal is without black.

Leiognathus dussumieri (Valenciennes).

Equula dussumieri Valenciennes: Hist. nat. Poiss., vol. 10, p. 56, pl. 283, 1835 (type loc., Coromandel Coast).—Kner: Reise "Novara," Fisch., vol. 2, pt. 5, p. 166, 1865 (Tahiti).

Agrees with *Leiognathus equula* in the absence of a black blotch on spinous dorsal, though according to Valenciennes figure the depth would be 2 and the side of the chest and breast is scaled. The back is also shown with rather close set, numerous, brown, vertical lines above the lateral line. Kner has recorded it from Singapore and Tahiti, and gives the depth 2 1/2 to 2 2/3 in the total length and says the edge of the first dorsal frequently tinged with dark brown. His specimens were 102 mm. long.

Leiognathus smithursti (Ramsay and Ogilby).

Equula smithursti Ramsay and Ogilby: Linn. Soc. New South Wales, Proc., 2nd ser., vol. 1, p. 11, 1886 (type loc., Hood Lagune, New Guinea).

Leiognathus smithursti Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 610, 1908 (Suva, Fiji).

Head 4 1/6 (in total); depth 2 2/5; tubes 60 in lateral line, which ceases short distance before caudal; eye, snout and interorbital equal, 3 in head. Silvery, washed with blue on back. Sides of head tinged with gold. Snout and band from upper angle of eye to opercle black. (Ramsay and Ogilby)

Leiognathus berbis (Valenciennes).

Equula berbis Valenciennes: Hist. nat. Poiss., vol. 10, p. 62, 1835 (type loc., Djedda and Lohaja, Red Sea) (on Forskål).

Equula neb Thiollière: Fauna Woodlark, p. 176, 1857 (type loc., Woodlark Island).

The imperfect account by Thiollière is based on a drawing and may refer to this species, which ranges from the Red Sea to the East Indies. Its long slender body, no scales on chest and no black on spinous dorsal are distinctive characters of *Leiognathus berbis.* The following items are from Thiollière:

Back narrowly compressed, body deepest near head, with depth scarcely 3 in body without caudal. Mouth with numerous pointed teeth. Lateral line nearly straight. Dorsal and anal anteriorly with low lobes. Ventral small, inserted before pectoral. Silvery, plumbeous on back.

Leiognathus fasciatus (Lacépède).

Clupea fasciata Lacépède: Hist. nat. Poiss., vol. 5, pp. 425, 460, 1803 (type loc., Mauritius).

Equula fasciata Schmeltz: Mus. Godeffroy, Cat. 4, p. 18, 1869 (Samoa; Viti Islands).—Schmeltz: op. cit., Cat. 5, p. 27, 1874 (Samoa; Viti; Tahiti).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 144, 1876 (Samoa).—Peters: Akad. Wiss. Berlin, Monatsb., p. 836, 1876 (1877) (New Britain).—Günther: Rept. voyage "Challenger," vol. 1, p. 35, 1880 (Ovalau, Fiji).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1383, 1906 (Upolu).

Leiognathus fasciatus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 273, 1905 (1906) (Apia; Pago

Pago).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 274, 1911 (Suva, Fiji).—Fowler: B. P. Bishop Mus., Bull. 22, p. 33, 1925 (Samoa).

Equula longispinis Valenciennes: Hist. nat. Poiss., vol. 10, p. 69, 1835 (type loc., Waigiu).

Easily recognized by the long second dorsal spine, which longer than the head or twice length of third.

The Agassiz Museum has 1 from Ebon Island, Marshall Islands, received from Rev. B. G. Snow, April, 1877, length 145 mm. In the National Museum 4 from Apia and 1 from Suva.

Red Sea, India, East Indies, Tahiti.

Secutor insidiator (Bloch).

Zeus insidiator Bloch: Nat. ausländischen Fische, pt. 3, p. 41, pl. 192, figs. 2-3, 1787 (type loc., Suratte).

Equula insidiatrix Kner: Reise "Novara," Fische, vol. 2, pt. 5, p. 169, 1865 (Tahiti).

Distinguished by the nearly vertical mandible, the mouth protractile horizontally and 8 to 10 vertical dark bands on upper half of body.

Seychelles, India, East Indies. Length 76 mm.

Gazza minuta (Bloch).

Scomber minutus Bloch: Nat. auslandischen Fische, pt. 9, p. 110, pl. 429, fig. 2, 1795 (type loc., Malabar).

Gazza minuta Schmeltz: Mus. Godeffroy, Cat. 4, p. 18, 1869 (Kandavu).—Peters: Akad. Wiss. Berlin, Monatsb., p. 836, 1876 (1877) (New Britain).—Ramsay and Ogilby: Linn. Soc. New South Wales, Proc., 2nd ser., vol. 1, p. 8, 1886 (Strickland River, New Guinea).

Zeus argentarius (Forster) Schneider: Systema ichth., Bloch, p. 96, 1801 (type loc., Pacific Ocean).—Lichtenstein: Descriptiones animalium, Forster, p. 288, 1844 (Tanna Island).

Gazza argentaria Günther: Cat. fishes Brit. Mus., vol. 2, p. 506, 1860 (type).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 144, pl. 91, fig. 3, 1876 (types).—Beaufort: Bijdr. Dierk., Amsterdam, vol. 19, p. 120, 1913 (Majalibit Bay, Waigiu).

Equula dentex Valenciennes: Hist. nat. Poiss., vol. 10, p. 66, 1835 (type loc., Pondicherry; Mauritius; Amboina; Vanicolo; Seychelles).—Kner: Reise "Novara," Fische, vol. 2, p. 170, 1865 (Tahiti).

Sparus scombroides (Forster) Günther: Cat. fishes Brit. Mus., vol. 2, p. 507, 1860 (name in synonymy; type).

Head 3 3/4 to 4 1/3 (in total); depth 2 1/5 to 2 1/3; D. VIII, 16; A. III, 14; canines moderate; second dorsal spine 2 2/3 in greatest body depth, nearly equals stronger second anal spine. Spinous dorsal brown anteriorly. Pectoral axil black. (Günther)

Bourbon Island, Mauritius, Seychelles, East Indies, Tahiti. Reaches 152 mm.

Gazza equulaeformis Rüppell.

Gazza equulaeformis Rüppell: Neue Wirbelth., Fische, p. 4, pl. 1, fig. 3, 1835 (type loc., Massaua, Red Sea).—Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).—Günther: Cruise of "Curacoa," p. 410, 1873 (Solomons).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 28, 1874 (Rarotonga).—Günther: Mus. Godeffroy, Jour., vol 5, pt. 11, p. 144, 1876 (Rarotonga; Solomons).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 38, 1878 (New Guinea).

Head 3 3/4 to 4 (in total); depth 2 1/2 to 2 2/3; D. VIII, 16; A. III, 14; canines large; second dorsal spine 2 in greatest body depth; second anal spine 3, stronger. Pectoral axil brown. (Günther)

Red Sea, East Indies, Rarotonga, Solomons. Reaches 152 mm.

KURTIDAE

Kurtus gulliveri Castelnau.

Kurtus gulliveri Castelnau: Linn. Soc. New South Wales, Proc., 1st ser., vol. 2, p. 233, 1878 (type loc., fresh water pond near Norman River).—Weber: Nova Guinea, vol. 9, pt. 4, p. 591, pl. 12, figs. 1-6, pl. 13, fig. 3, 1913 (Varen River; Lorentz River; Bivak Island).

Cyrtus gulliveri Ramsay and Ogilby: Linn. Soc. New South Wales, Proc., 2nd ser., vol. 1, p. 10, 1886 (type; Strickland River, New Guinea).

Known by the horizontally directed spine between the ventral fins. The skull ends posteriorly in a curved spine bent forward. Length 128 mm.

East Indies.

CHEILODIPTERIDAE

Amia nematoptera (Bleeker).

Apogon nematoptera Bleeker: Soc. Sci. Ind. Neerl. Act. (Manado), vol. 1, p. 35, 1856 (type loc., Manado, Celebes).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 236, 1882 (New Guinea).

Broad, vertical, blackish zone around body, occupying whole space beneath first dorsal, posteriorly irregularly spotted with brownish. First and second dorsal rays filamentous. Length 83 mm. (Günther, Bleeker).

Two from New Guinea in the National Museum, 65 mm.

East Indies.

Amia orbicularis (Cuvier).

Apogon orbicularis (Kuhl and Van Hasselt) Cuvier: Hist. nat. Poiss., vol. 2, p. 115, 1828 (type loc., Java).—Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 22, pl. 20, fig. D, 1873 (Radick Island).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 12, 1877 (Pelew Islands).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 12, 1885 (Rubi, New Guinea).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 277, 1911 (Moen, Truk Group, Carolines).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 114, 1913 (Majalibit Bay, Waigiu).

Apogon nigromaculatus Hombron and Jacquinot: Voyage "Astrolabe," Zool., vol. 3, p. 32, pl. 1, fig. 2, 1853 (type loc., New Guinea).

Apogon novae-hollandiae Schmeltz: Mus. Godeffroy, Cat. 6, p. 12, 1877 (Pelew Islands).

Head 2 1/4 to 2 1/2; depth 1 7/8 to 2; D. VI-I, 9, 1; A. III, 8, 1; scales 22 in line to caudal base and 3 more on latter; 2 scales above lateral line, 6 or 7 below, predorsal 5; snout 3 3/4 to 4 1/3 in head measured from upper jaw tip; eye 2 1/3 to 2 2/3; maxillary 2; interorbital 3 1/4 to 3 3/5.

Body deeply ovoid, compressed. Caudal peduncle well compressed, least depth 1 to 1 1/6 in its length or 2 to 2 1/10 in total head length. Head width 2 1/5 to 2 1/2 in its length. Snout convex, prominent in profile, length 2/3 its width. Eye large, hind pupil edge midway in total head length; diameter greater than snout or interorbital. Mouth large, lower jaw protruding. Maxillary reaches middle of eye, expansion 2 in eye. Teeth fine, in bands in jaws, on vomer and palatines. Front nostril not distinct; hind nostril close before eye. Interorbital slightly depressed. Preopercle edge minutely serrated, ridge entire. Gill rakers III, 4 + 19, lanceolate, 2 1/2 in eye; gill filaments 3/4 of gill rakers. Scales with 15 basal radiating striae; apical denticles 100 to 117, in 3 to 4 transverse series; circuli very fine. Second dorsal spine 1 1/4 in total head length; first spine of second dorsal 1 2/5; second dorsal ray 1 1/4 to 1 1/3; second anal spine 1 2/5 to 1 3/5; first anal ray 1 1/4; caudal 1 to 1 1/6, slightly emarginate; pectoral 1 1/3 to 1 2/5; ventral 1 1/6 to 1 1/4.

Body pale brownish, scarcely paler below. Dark brown band obliquely from spinous dorsal origin until

down across belly before vent. Row of 4 or 5 dusky blotches along median side of caudal peduncle, 4 across base of caudal, 1 near edge of caudal peduncle above; several as 2 transverse rows between soft dorsal and anal, these include several of median lateral series. Spinous dorsal with dark brown streak on first membrane of spinous dorsal, also several other dark brown spots basally and edge of fin deep brown. Ventral dark or blackish terminally, pale basally. Soft dorsal and anal pale, each with subbasal brown line. Opercle with silvery reflections. Length 54 to 73 mm.

In the Agassiz Museum 3 from Ponapé, Caroline Islands, obtained by Rev. L. H. Gulick, 2 from the Pelew Islands through R. Torrey, 3 from the Kingsmill Islands through Andrew Garrett and 6 small ones from Truck. In the National Museum 7 from Moen.

Apogon nigromaculatus Hombron and Jacquinot seems only a variant, in color, of this species. Likely the record by Schmeltz for *Apogon novae hollandiae* Valenciennes (Mus. Hist. Nat. Paris, Nouv. Ann., vol. 1, p. 55, pl. 4, fig. 2, 1832, type loc., New Holland) may pertain to this species. Valenciennes gives a figure with a round black spot at the supra-scapula. He describes the color as red, little silvery below. Ventrals and edge of dorsal blackish.

Andamans, Radick, East Indies, Micronesia. Reaches 102 mm.

Amia trimaculata (Cuvier).

Apogon trimaculatus Cuvier: Hist. nat. Poiss., vol. 2, p. 115, pl. 22, 1828 (type loc., Buru, one of the Moluccas).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 256, 1883 (New Guinea).

D. VI-I, 9; A. II, 9; scales 26. Red, with 3 black saddles on back, first at spinous dorsal, second at soft dorsal and third on caudal peduncle above. Length 178 mm. (Cuvier)

East Indies.

Amia trifasciata (Weber).

Apogon trifasciatus Weber: Nova Guinea, vol. 9, pt. 4, p. 580, fig. 32, 1913 (type loc., Regen Island; Sabang; Alkmaar; Lorentz River, New Guinea).

D. VI-I, 10; A. I, 10; scales in lateral line 35 or 36, transversely 19 or 20. Three dark vertical bands, first at front of spinous dorsal, second at soft dorsal and third at caudal base. Length 135 mm. (Weber)

New Guinea.

Amia sandei (Weber).

Apogon sandei Weber: Nova Guinea, vol. 5, pt. 2, p. 247, pl. 12, fig. 2, 1908 (type loc., Wagani River in Urana Basin, southern New Guinea).—Weber: op. cit., vol. 9, pt. 4, p. 580, 1913 (Reiger River; Sabang; Regen Island; Alkmaar; Lorentz River).—Regan: Zool. Soc. London, Trans., vol. 20, pt. 6, p. 276, 1914 (Mimika River, New Guinea).

D. VI-I, 10; A. II, 10; scales 45 or 46 in lateral line; 5 above, 12 or 13 below. Nine dark vertical bands on trunk and tail. Length 100 mm. (Weber)

New Guinea.

Amia wichmanni (Weber).

Apogon wichmanni Weber: Nova Guinea, vol. 5, pt. 2, p. 248, pl. 12, fig. 3, 1908 (type loc., Lake Sentani, Sekanto, Moso and Tawarin River, northern New Guinea).—Weber: op. cit., vol. 9, pt. 4, p. 579, 1913 (Sentani Lake, Sermowai, Njao, Bigowre River, Kaiserin Augusta River).

D. VI-I, 9; A. II, 9; tubular scales 25 or 30 in lateral line, scales 35 to 38, above 3 or 4, below 12 to 14. Eight dark bands, inclined forward on side, mostly below lateral line and last 3 faintly form horizontal bands on caudal peduncle. Dark streak from eye to suprascapula and another from eye down over cheek behind maxillary. Length 220 mm. (Weber)

New Guinea.

Amia rhodopterus (Bleeker).

Apogon rhodopterus Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 62, 1852 (type loc., Singapore).

Pristiapogon koilomatodon Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 33, 1906 (Shortland Island, Solomons).

Amia koilomatodon Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 240, fig. 34, 1905 (1906) (Apia; Pago Pago).

Head 2 3/5; depth 2 1/2; D. VI-I, 9, 1; A. II, 8, 1; scales 24 in lateral line to caudal base and 3 to 5 more on latter; 2 scales above lateral line, 6 or 7 below; 5 predorsal scales; head width 1 7/8 to 2 in head; snout 3 1/3; eye 3 1/2 to 3 3/4; maxillary 2 to 2 1/10; interorbital 4 to 4 2/3. Gill rakers IV, 2 + 12, IV, lanceolate, slightly longer than gill filaments or 2 1/3 in eye. Scales with 16 to 18 basal radiating striae, sometimes 4 more incomplete auxiliaries; apical denticles 154 to 158 with 2 series of basal elements. Color-pattern in agreement with Jordan and Seale's figure.

Two in the Bishop Museum from Shortland Island, 135 and 138 mm. Three in the National Museum from Samoa.

Compared with Bleeker's figure of *Apogon koilomatodon*, the Shortland specimens show small black spot much smaller than pupil at caudal base, short narrow black vertical bar at soft dorsal origin and another on middle of upper caudal peduncle edge. Both also have black opercular blotch little smaller than eye and obscure brown subbasal line along base of soft dorsal, besides faint trace of dark oblique streak from eye across cheek to preopercle angle. *Amia rhodopterus* Bleeker is described and figured by the same author with 2 transverse dorsal bands, based on 3 specimens 115 to 140 mm. long. This is nearer to my specimens in every way than *Apogon koilomatodon*, which is based on 4 large specimens 142 to 153 mm. Bleeker states the latter differs in its lower body, the absence of the black caudal spot and the presence of the violet border to caudal above and below. The 2 specimens before me combine in every way the color pattern and I think *Apogon koilomatodon* a synonym.

Amia bandanensis (Bleeker).

Apogon bandanensis Bleeker: Nat. Tijds. Ned. Ind., vol. 6, p. 95, 1854 (type loc., Banda, Neira).—Bleeker: Soc. Sci. Ind. Neerl., Act., vol. 6, p. 4, 1859 (Doreh, New Guinea).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 484, 1901 (Samoa).—Weber: Siboga Exped., vol. 65, p. 222, 1913 (Atjatuming, west coast New Guinea).

Amia bandanensis Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 13, 1925 (Wake Island).

Apogon cupreus Schmeltz: Mus. Godeffroy, Cat. 4, p. 13, 1869 (Upolu).

Apogon savayensis Günther: Zool. Soc. London,

Proc., p. 656, 1871 (type loc., Savay, Samoan Islands).—Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 22, pl. 19, fig. B, 1873 (Samoa; Tonga; Yap; Tahiti; Celebes).—Günther: Rept. voyage "Challenger," vol. 1, p. 30, 1880 (Levuka, Fiji).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 372, 1897 (Rotuma).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 76, 1900 (1901) (Guam).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 277, 1911 (Kusaie, Carolines).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 115, 1913 (Saonek, Waigiu).

Amia savayensis Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 33, 1906 (Faté, New Hebrides; Shortland Island, Solomon Islands; Raiatea, Society Islands).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1379, 1906 (Upolu; Savaii).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 239, fig. 33 1905 (1906) (Apia; Pago Pago).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 102, 1912 (Mangareva, Paumotus).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 117, 1922 (Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 22, p. 32, 1925 (Samoa).

Apogon nubilus Garman: Mus. Comp. Zool., Bull., vol. 39, p. 229, 1903 (type loc., Suva, Fiji).

In the National Museum 1 from Samoa, 2 Fiji, 1 Fiji or Oahu, and 1 Fiji or Samoa, all from the Wilkes Expedition. Others from the Bureau of Fisheries as series from Apia and Pago Pago, 1 Kusaie and 7 Mangareva. The Bishop Museum contains 3 Agaña, Guam, 3 Faté, 8 Raiatea in Society Islands, 1 Makatea, and 6 Shortland Island. Also 1 from Wake Island in 1923. In the Agassiz Museum the type of *Apogon nubilus,* 2 Ponapé from Rev. L. H. Gulick, 5 Apia, 4 Pelew Islands, 1 Kusaie, 10 Mangareva. The Academy has 10 from Apia.

East Africa to the East Indies and Tahiti.

Amia nigricans (Day) (fig. 38).

Apogon nigricans Day: Fishes of India, vol. 1, p. 58, pl. 16, fig. 3, 1875 (type loc., Madras).

Head 2 2/5; depth 2 2/5; D. VII-I, 9; A. II, 8; scales 22 in lateral line to caudal base and 3 more on latter; 2 scales above lateral line, 6 below; snout 4 in head; eye 2 1/3; maxillary 2; interorbital 3.

Dark brown. Row of obsolete dusky spots from gill opening medianly back toward caudal base, also dusky blotch below last dorsal rays and another opposite bases of last anal rays. Pectoral pale, with brownish base. Vertical fins and ventrals all more or less dusky, though last rays of soft dorsal and anal paler or grayish. Length 28 mm.

In the Agassiz Museum 3 from the Pelew Islands, obtained by R. Torrey in 1862. It appears to agree with Day's figure of *Apogon nigricans* in many respects, except that it does not show any traces of the dark vertical bars. *Amia melas* Fowler (Acad. Nat. Sci. Philadelphia, Proc., p. 17, fig. 8, 1918, Philippines) is doubtless a synonym. In my case it is preoccupied by *Apogon melas* Bleeker 1848.

Amia hartzfeldii (Bleeker).

Apogon hartzfeldii Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 254, 1852 (type loc., Amboina).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).

Rose colored. Large round black basal caudal blotch. Each side of back, near upper profile, light blue longitudinal band. Second dorsal and anal with brown basal band. Length 114 mm. (Bleeker, Günther)

East Indies.

Amia novemfasciata (Cuvier).

Apogon novemfasciatus Cuvier: Hist. nat. Poiss., vol. 2, p. 114, 1828 (type loc., Timor; Guam).—Valenciennes: op. cit., vol. 6, p. 372, 1830 (Guam).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, pp. 3, 4, 1859 (Doreh, New Guinea).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 114, 1913 (Saonek, Waigiu).

Amia novemfasciata Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 32, 1906 (Faté, New Hebrides).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25,

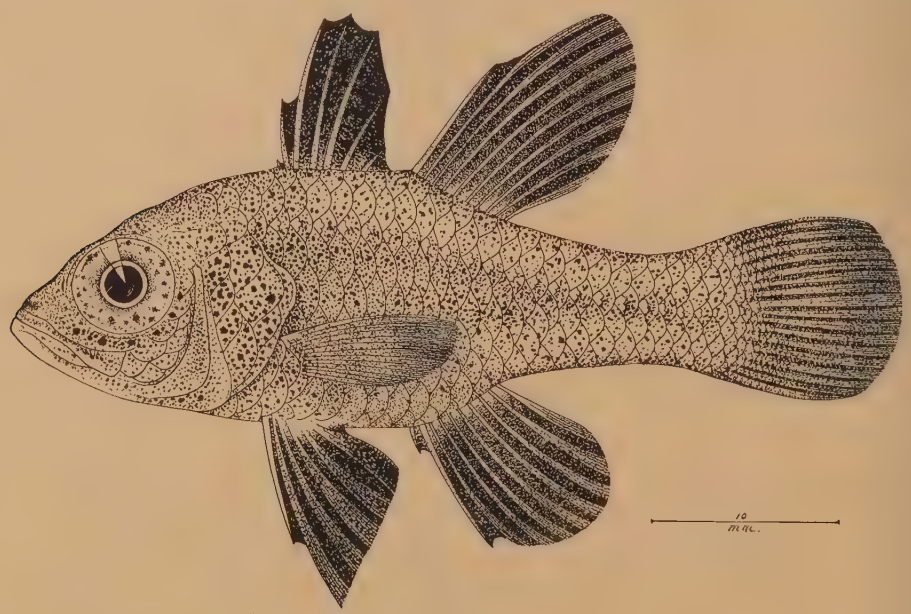

FIGURE 38.—Drawing of *Amia nigricans.*

p. 242, figs. 36-37, 1905 (1906) (Pago Pago; Apia).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 117, 1922 (Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 22, p. 8, 1925 (Guam).

Apogon fasciatus (non White) Quoy and Gaimard: Voyage "Uranie," Zool., p. 344, 1825 (Guam).—Kner: Reise "Novara," Fische, vol. 1, pt. 5, p. 43, 1865 (Tahiti). Schmeltz: Mus. Godeffroy, Cat., 4, p. 13, 1869 (Upolu). —Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 19, pl. 20, fig. B, 1873 (Society Islands; Kingsmill Islands; Apia, Samoa).—Streets: U. S. Nat. Mus., Bull., no. 7, p. 100, 1877 (Samoa).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 372, 1897 (Rotuma). —Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 75, 1900 (1901) (Guam).

Amia fasciata Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1379, 1906 (Apia; Upolu).

Apogon popur Thiollière: Fauna Woodlark, p. 143, 1857 (type loc., Woodlark Island).

Cantherè popur (Montrouzier) Thiollière: Fauna Woodlark, p. 143, 1857 (name in synonymy).

Apogon cookii Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 236, 1882 (New Guinea).

In the Agassiz Museum, 7 Ponapé from Rev. L. H. Gulick; 1 Tongoa, Espirito Sancti Island in New Hebrides; 10 from Society Islands; 16 Kingsmill Islands; 2 Ebon Island, and 8 Ascension Island, Marshall Islands. The National Museum has 1 from Fiji and 2 from Fiji or Oahu, 68 to 77 mm., obtained by the Wilkes Expedition. Others through the Bureau of Fisheries are 8 from Apia and 4 Fiji. Also 3 from Samoa through Steinberger. The Bishop Museum has 5 from Faté, 1 Tubuai, and 19 from Guam. Also 3 from Guam in 1923. Largest 88 mm.

Apogon popur Thiollière is described with the depth a little less than 3 and the body, leaden-gray with 5 brown longitudinal lines. Length 102 mm.

Probably *Apogon cookii* Macleay (Linn. Soc. New South Wales, Proc., vol. 5, p. 344, 1881, type loc., Endeavour River and Darnley Island) is the same. It is described with 4 or 5 very wide dark longitudinal bands as in *Amia fasciata,* but terminating in a somewhat round brown patch at the root of the tail. Its length 75 mm.

Seychelles, East Indies, Tahiti.

Amia aroubiensis (Hombron and Jacquinot).

Apogon aroubiensis Hombron and Jacquinot: Voyage "Astrolabe," Zool., vol. 3, p. 31, pl. 1, fig. 1, 1853 (type loc., Aroub, Malaysia).

Amia aroubiensis Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 33, 1906 (Tubuai, Austral Islands; Nukuhiva, Marquesas; wrongly as "Papiete, Tahiti").—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 241, fig. 35, 1905 (1906) (Apia; Pago Pago).

Apogon fasciatus (non White) Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 19, pl. 20, fig. A, 1873 (part).

Greatly like *Amia novemfasciata,* but colors darker and black longitudinal bands not extending on caudal fin.

In the Bishop Museum 3 from Tubuai, 1 from Nukuhiva, and 2 from Raiatea, Society Islands, last wrongly reported from "Papiete, Tahiti." Largest specimen 85 mm. In the National Museum 5 from Apia and 1 from Mangareva.

East Indies to Samoa.

Amia compressa Radcliffe.

Amia compressa (Smith and Radcliffe) Radcliffe: U. S. Nat. Mus., Proc., vol. 41, p. 246, pls. 20-21, 1912 (type loc., Port Matalvi, west coast Luzon; Quinalasag Island, east Luzon; Philippines; Borneo; Moluccas).

Amia aroubiensis (non Hombron and Jacquinot) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 33, 1906 (Shortland Island, Solomons).

Head 2 2/3; depth 2 4/5; D. VI-I, 9, 1; A. II, 9, 1; scales 23 in lateral line to caudal base and 4 more on latter; 2 scales above lateral line, 6 below; 5 predorsal scales; head width 2 1/5 in its length; snout 4 1/2 in head measured from upper jaw tip; eye 2 1/4; maxillary 2; interorbital 3 1/3. Gill rakers 8 + 22, slender, lanceolate, 2 in eye; gill filaments 1/3 of gill rakers. Scales with 12 to 18 basal radiating striae, edge slightly scalloped; apical denticles 71 to 77, with basal elements in 1 to 3 series.

Six dark brown longitudinal bands, uppermost along dorsal bases. Next lateral band forks near front of lateral line, sending upper branch to occiput and lowe to eye; median extends from eye to caudal base medially where ending in black spot not greater than its own width, then sends short upper and lower branch on caudal base; both lateral bands and one from lower eye edge to pectoral axil, extend out on bases of respective caudal rays. Dorsals and caudal largely dusted dusky terminally. Soft dorsal and anal each with blackish line horizontally subbasally, posteriorly extending well out on last ray. Pectoral and ventral pale. Upper and lower caudal edges narrowly dusky.

One in the Bishop Museum from Shortland Island, 70 mm. long. This specimen agrees in every way with Radcliffe's figures. The species is an addition to the fish fauna of Oceania.

Amia beauforti (Weber).

Apogon beauforti Weber: Nova Guinea, vol. 5, pt. 2, p. 246, pl. 13, fig. 4, 1908 (type loc., Lake Sentani, northern New Guinea).—Weber: op. cit., vol. 9, pt. 4, p. 580, 1913 (Lake Sentani and Cape Djnar in Humboldt Bay).

D. VI-I, 9; A. II, 9; scales 37 or 38 in lateral line, 5 above, 14 or 15 below. Dark streak from eye to suprascapula and another down and back across cheek. Body with 5 black longitudinal bands, not extending on caudal. Length 190 mm. (Weber)

New Guinea.

Amia frenata (Valenciennes).

Apogon frenatus Valenciennes: Mus. Hist. Nat. Paris, Nouv. Ann., vol. 1, p. 57, pl. 4, fig. 4, 1832 (type loc., New Guinea; Guam).—Günther: Cat. fishes Brit. Mus., vol. 1, p. 241, 1859 (Fiji).—Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 19, pl. 19, fig. A, 1873 (Hawaiian islands; Society Islands; Paumotus).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 372, 1897 (Rotuma).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 276, 1911 (Papiete, Tahiti).—Weber: Nova Guinea, vol. 9, pt. 4, p. 582, 1913 (Tanah Merah Bay).

Apogon (*Pristiapogon*) *frenatus* Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 484, 1901 (Honolulu).

Amia frenata Bleeker: Atlas ichth., vol. 7, p. 89, pl. (64) 342, fig. 2, 1873-76 New Guinea).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 8, 25, 1925 (Guam; Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 13, 1925 (Johnston Island and French Frigates Shoal).—Fowler: op. cit., Bull. 38, p. 12, 1927 (French Frigates Shoal and Kahoolawe Island).

Amia kallopterus Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).

Apogon snyderi Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 180, 1902 (1903) (type loc., Honolulu; Hilo).—Jenkins: op. cit., p. 448, 1902 (1903) (Honolulu).—Snyder: op. cit., p. 526, 1902 (1904) (Honolulu).—Snyder: op. cit., p. 526, 1902 (1904) (Honolulu; Hanalei Bay, Kauai; Laysan Island; off Molokai in 8 fathoms).—Jordan and Evermann: op. cit., vol. 23, pt. 1, pl. 36, 1903 (1905) (type).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 527, 1906 (Honolulu).

Amia snyderi Jordan and Evermann: U. S. Fish Comm., vol. 23, pt. 1, p. 214, 1902 (Honolulu; Hilo).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 237, 1905 (1906) (Apia; Pago Pago).

Pristiapogon snyderi Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 33, 1906 (Tubuai, Austral Islands; Faté, New Hebrides; Shortland Island, Solomons; Raiatea, Society Islands).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 42, Dec. 1922 (Honolulu).

Apogon menesemus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 448, fig. 19, 1902 (1903) (type loc., Honolulu).—Snyder: op. cit., vol. 22, p. 526, 1902 (1904) (Honolulu; Laysan; off Molokai in 8 fathoms).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 527, 1906 (Hawaiian islands).

Apogon menesenus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 17, 1902 (Honolulu).

Amia menesema Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 215, pl. 13, fig. 86, 1903 (1905) (Honolulu; Hilo; Kailua).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).

Pristiapogon menesema Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 42, 1922 (Honolulu).

?Amia exostigma (Jordan and Starks) Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 238, fig. 31, 1905 (1906) (type loc., Apia, Samoa).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 101, 1912 (Mangareva, Paumotus).

Apogon exostigma Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 278, 1911 (Makemo, Paumotus).

In the National Museum 1 from Oahu and 1 from Fiji or Oahu, obtained by the Wilkes Expedition. Others, largely through the Bureau of Fisheries are 20 from Hawaiian islands, 10 Honolulu, 2 Hanalei Bay, 1 Makemo, 2 Mangareva, 1 Papeete, 8 Laysan, 9 Samoa, 2 Apia and the type of *Apogon snyderi.* The Bishop Museum has 27 from Honolulu, 2 Shortland Island, 1 Faté, 2 Raiatea, 5 Tubuai, 1 Nukuhiva. Also 3 from French Frigates Shoal and 6 from Johnston Island in 1923. In the Honolulu markets, during November and December, 1922, I examined 371 specimens. Two from Guam in 1923. In the Agassiz Museum 22 from the Society Islands, 3 Apiang, 2 Hawaiian islands, 1 from Maui through C. F. Winslow and 2 from Apia. In the Academy 9 Hawaiian specimens.

Though Kendall and Goldsborough note a specimen of *Apogon exostigma* 139 mm. long, they say its "color same as that given by Jordan and Starks," which would seem to vindicate this as a valid species. It is, however, remarkably close to *Amia frenata,* if not the same. In view of Jordan and Seale's admission of *Amia melanorhynchus* (Atlas ichth., vol. 8, pl. [65] 343, fig. 1, 1877) which shows a black caudal spot at the end of the dark lateral band and the figure of *Apogon frenatus* Günther (1873), which certainly has the combination of color design in the dark median lateral band of the nominal *Amia exostigma,* the caudal markings of *Amia menesema* and the fin markings of both, besides those of *Apogon snyderi,* no valid characters are available to distinguish these nominal forms.

Mauritius to the East Indies, Hawaii and Tahiti.

Amia amboinensis (Bleeker).

Apogon amboinensis Bleeker: Nat. Tijds. Ned. Ind., vol. 5, p. 329, 1853 (type loc., Amboina).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 236, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 256, 1883 (New Guinea).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 115, 1913 (River Waiu waige tidal, Waigiu).

Yellowish, with 2 brown longitudinal bands, 1 running from above eye to side and curved, other from muzzle through eye to tail. Round black spot at caudal base. First dorsal black in front, fins otherwise uniform. (Günther)

East Indies. Reaches 98 mm.

Amia sealei Fowler (fig. 39).

Amia sealei Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 20, fig. 9, 1918 (type loc., Philippine Islands).

Amia amboinensis (non Bleeker) Seale: B. P. Bishop

FIGURE 39.—Drawing of *Amia sealei.*

Mus., Occ. Papers, vol. 4, no. 1, p. 32, 1906 (Shortland Island, Solomons).

Head 2 3/5; depth 2 5/6; D. VII-I, 9, 1; A. II, 8, 1; scales 22 in lateral line to caudal base and 3 more on latter; 2 scales above lateral line, 6 below; 4 predorsal scales; head width 2 1/3 its length; snout 4; eye 2 2/3; maxillary 2 1/5. Gill rakers 11, 3 + 12, 11, lanceolate, slightly longer than gill filaments or 3 1/3 in eye. Scales with 9 to 11 basal radiating striae, with 1 to 4 incomplete auxiliaries; apical denticles 88 to 90, basal elements in 2 series; circuli very fine. Preopercle edge finely denticulate, ridge entire.

Faded dull brown. Narrow blackish line from snout tip through eye to caudal base, with small round black spot half pupil on latter close above; another similar and less distinct line from above and behind eye parallel along back and upper surface of caudal peduncle, though approaches bases of upper caudal rays, rather than black caudal spot. Narrow indistinct dusky line along bases of both dorsals. Spinous dorsal dusted with dusky terminally. Soft dorsal with pale dusky dots, leaving horizontal pale narrow line from origin of fin out toward ends of last rays (evidently faded out of types). No traces of any dark bands below median lateral one.

One in the Bishop Museum from Shortland Island, 65 mm. long.

Though allied with *Apogon amboinensis* Bleeker my types of *Amia sealei* all show 3 dark longitudinal lines on the back and all separated. Bleeker's figure shows the median lateral line and the one above fused on the side of the caudal peduncle. Moreover, he indicates a dark horizontal line on the soft dorsal and anal basally, whereas in the Shortland specimen this condition is entirely reversed, the line being pale or white.

Amia ceramensis (Bleeker).

Apogon ceramensis Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 256, 1852 (type loc., Wahai, Ceram).—Schmeltz: Mus. Godeffroy, Cat. 7, p. 12, 1877 (South Sea).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 114, 1913 (Majalibit Bay).

Amia ceramensis Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 278, 1911 (Moen, Truk Group, Carolines; Suva, Fiji; Arhno, Marshalls).

Head 2 1/3; depth 3 1/4; D. VI-I, 9; A. II, 8; scales 22? (pockets) in lateral line to caudal base and 3 more on latter; snout 4 1/5 in head measured from upper jaw tip; eye 2 4/5; maxillary 2; interorbital 4.

Body compressed, deepest at spinous dorsal origin. Caudal peduncle well compressed, least depth 2 1/5 in its length or 3 1/5 in total head length. Head width 3 in its length. Snout convex, long as wide. Eye large, hind pupil edge midway in head length; diameter greater than snout or interorbital. Mouth large, lower jaw protruding. Maxillary reaches opposite middle of eye; expansion 2 in eye. Teeth villiform, in narrow bands in jaws, on vomer and palatines. Front nostril near middle in snout; hind nostril close before eye. Interorbital depressed. Hind preopercle edge finely denticulate, ridge entire. Gill rakers 4+15, lanceolate, equal gill filaments, which 2 in eye. Scales with 6 or 7 basal radiating striae; apical denticles 14 to 17, in 3 transverse series; circuli moderate. Third dorsal spine 2 1/5 in total head length; first dorsal ray 2; second anal spine 2 1/2; first anal ray 1 3/4; caudal 1 1/4, emarginate; pectoral 1 1/2; ventral 2 1/3.

Pale brown generally, side of head and iris silvery-white. Round black spot, about 1/3 size of pupil, at base of caudal medianly. Spinous dorsal dusky terminally. Fins all pale. Length 24 mm.

In the Agassiz Museum 3 in poor condition and scales mostly fallen, from Moen, Carolines, obtained by the *Albatross*. They do not show the dark median line on the trunk and dark subbasal band on soft dorsal and anal, as in Bleeker's figure (Atlas ichth., vol. 7, p. 91, vol. 8, 1873-76, pl. [58] 336, fig. 1, 1876-77). Also 6 from Suva, 5 from Arhno and 6 from Truk.

Nicobars, East Indies, Marshall Islands and Fiji.

Amia fleurieu (Lacépède).

Ostorhinchus fleurieu Lacépède: Hist. nat. Poiss., vol. 4, pp. 23, 24, (pl. 3, fig. 2, in vol. 3, 1802) 1802 (type loc., Great Equinoxial Ocean [Indo-Pacific]).

Amia aurea Bleeker: Atlas ichth., vol. 7, p. 92, pl. (59), 337, fig. 1, 1873-76 (Waigiu).

Apogon aureus Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 114, 1913 (Saonek, Waigiu).

Golden, fins red or rosy. Two blue lines on side of snout from mouth to eye and 2 also parallel over postocular. Blackish at caudal base. Sometimes violet band along anal base. Length 104 mm. (Bleeker)

Red Sea and East Africa to the East Indies and China.

Amia fusca (Quoy and Gaimard).

Apogon fusca Quoy and Gaimard: Voyage "Uranie," Zool., p. 345, 1825 (type loc., Guam).—Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 22, 1873 (Fiji).

Amia fusca Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 244, fig. 38, 1905 (1906) (Apia).

Apogon monochrous Günther: Cat. fishes Brit. Mus., vol. 1, p. 236, 1859 (Fiji).

Apogon monochreus Schmeltz: Mus. Godeffroy, Cat. 4, p. 13, 1869 (Upolu).

Golden, frequently dotted or dusted with brown. Fins rosy. Iris golden or yellow. Spinous dorsal brown or dusky terminally. Length 101 mm. (Bleeker)

One from Apia in the National Museum.

Apogon guamensis Valenciennes (Mus. Hist. Nat. Paris, Nouv. Ann., vol. 1, p. 54, 1832, type loc., Guam), imperfectly described, is said to resemble *Amia fusca*. It is described with a shorter snout, broader and more convex interorbital, back more arched, spinous dorsal lower, anal higher, and uniform red with silvery reflections, brighter below. Fins uniform greenish gray. Length 77 mm.

Red Sea, East Indies, Micronesia, Polynesia.

Amia maculosa (Valenciennes).

Apogon maculosus Valenciennes: Hist. nat. Poiss., vol. 6, p. 371, 1830 (type loc., Sea of the Indies).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 13, 1869 (Upolu).

D. VII-I, 8; A. II, 7. Brown, deep at front part of back and 4 series of brown spots each side, but none on head. Fins brown, with obsolete marks of large dots. Caudal and pectoral very dark. Length 77 mm. (Valenciennes)

Only known since the original imperfect description by the record given in Schmeltz.

Amia melas (Bleeker).

Apogon melas Bleeker: Ind. Archipel., Jour., vol. 2, p. 635, 1848 (type loc., Bima, Sumbawa).—Beaufort:

Bijdr. Dierk. Amsterdam, vol. 19, p. 115, 1913 (Majalibit Bay, Waigiu).

Generally dusky, with large, black, white edged basal ocellus on soft dorsal and anal. According to Bleeker reaches 104 mm.

East Indies.

Amia sangiensis (Bleeker).

Apogon sangiensis Bleeker: Nat. Tijds. Ned. Ind., vol. 13, p. 375, 1857 (type loc., Sangi Islands).—Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 20, 1873 (Yap).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 235, 1882 (New Guinea).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 18, p. 206, 1912 (Port Sandwich, New Hebrides).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 114, 1885 (Majalibit Bay, Waigiu).

Head 2 1/2; depth 3; D. VI-I, 9; A. II, 9; scales (pockets) 23 in lateral line to caudal base and 3 more on latter; 8 scales transversely; snout 3 3/4 in head measured from upper jaw tip; eye 3 1/2; maxillary 2 1/4; interorbital 4 1/2.

Body little compressed. Caudal peduncle well compressed, least depth 1 2/3 in its length or 2 7/8 in total head length. Head width 3 in its length. Snout convex, length slightly less than its width. Eye with hind pupil edge nearly midway in total head length, little longer than snout or interorbital. Mouth large, jaws nearly even. Maxillary extends 2/5 in eye; expansion 2 in eye. Teeth fine, in narrow bands in jaws, on vomer and palatines. Front norstril near middle of snout; hind one close before eye. Interorbital slightly depressed, save for low front median ridge. Preopercle edge minutely dentate, ridge entire. Gill rakers 6+15, lanceolate, twice length of gill filaments or 2 1/2 in eye. Scales all fallen. Second dorsal spine 1 4/5 in head; first dorsal ray 1 4/5; second anal spine 2 2/5; caudal 1 2/5, emarginate.

Brownish generally, apparently little paler on lower surface of head and abdomen. Sides of head and iris with silvery-white reflections. Fins all brownish. First membrane of spinous dorsal blackish. Both soft dorsal and anal with subbasal obsolete dark streak. Dark band along side of snout and behind eye across opercle. No median lateral dark band or line. Round dusky spot at caudal base but little smaller than pupil. Length 53 mm.

In the Agassiz Museum 1 from Ascension Island in the Marshalls, obtained by Rev. A. A. Strong in 1877. It differs a little from Day's figure of *Apogon sangiensis* in that the dark postocular band is now little distinct, also there is no dark blotch below last dorsal rays on back.

Andamans, East Indies, Marshalls. Reaches 84 mm.

Amia hyalosoma (Bleeker).

Apogon hyalosoma Bleeker: Nat. Tijds. Ned. Ind., vol. 5, p. 329, 1853 (type loc., Amboina; Batavia, Samarang, Java; Bima, Sumbawa; Benculen, Padang, Priaman, West Sumatra).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 13, 1869 (Kandavu).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 12, 1885 (Rubi, New Guinea).—Perugia: Mus. Genova, Ann., vol. 34, p. 547, 1894 (Inawi River, San Giuseppe, district Makeo, New Guinea).—Weber: Nova Guinea, vol. 9, pt. 4, p. 581, 1913 (Kajo Bay and Mbai River).

Apogon armatus Thiollière: Fauna Woodlark, p. 144, 1857 (type loc., Woodlark Island).

Canthère popur (Montrouzier) Thiollière: Fauna Woodlark, p. 144, 1857 (name in synoymy).

Olivaceous above, sides silvery yellow. Iris and fins yellow. Round black spot at caudal base, less distinct with age. Length 170 mm. (Bleeker)

Apogon armatus Thiollière is described with the second dorsal spine very strong and the color brown, deeper on back and black spot each side of tail.

Seychelles, East Indies.

Amia hypselonotus (Bleeker).

Apogon hypselonotus Bleeker: Nat. Tijds. Ned Ind., vol. 8, p. 309, 1855 (type loc., Batu Archipelago).—Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 20, 1873 (South Pacific).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 372, 1897 (Rotuma Island)

Apogon leptacanthus Schmeltz: Mus. Godeffroy, Cat. 4, p. 13, 1869 (South Pacific).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 235, 1882 (New Guinea).

Amia doryssa Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 245, fig. 39, 1905 (1906) (type loc., Apia, Samoa).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 103, 1912 (Mangareva, Paumotus).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 13, 1925 (Wake Island).

Head 2 1/2; depth 2 3/4; D. VI-I, 9; A. II, 8; tubular scales 23 in lateral line to caudal base and 1 more on latter, 2 above, 5 below, 7 predorsal; snout 4 1/8 in head; eye 3; maxillary 2; interorbital 3 7/8.

Body compressed, elongately ovoid, deepest at spinous dorsal origin. Caudal peduncle strongly compressed, least depth 1 1/2 in its length or 2 2/5 in head. Head width 2 in its length. Snout broadly depressed, length half its width. Eye with hind edge midway in head length, diameter much greater than snout or interorbital. Mouth large, oblique, jaws even. Maxillary reaches opposite hind pupil edge, expansion 1 4/5 in eye. Teeth minutely villiform, in bands in jaws, on vomer and palatines; tongue smooth. Nostrils separated, front one about 3/5 in snout, hind one close before eye. Interorbital nearly level, slight depression each side of median line. Preopercle ridge entire; hind edge with few minute, though firm, denticles. Gill rakers 11, 2+11, lanceolate, 1/3 longer than gill filaments or 2 1/2 in eye.

Scales with 12 to 14 basal radiating striae; apical denticles 48 to 64, with 2 transverse series; circuli very fine. Cheek with 2 rows of scales. Caudal base scaly. Lateral line arched concurrently with dorsal profile; tubes long, simple, each well exposed. Second dorsal spine 1 2/3 in head, second ray 1 9/10; second anal spine 2, second ray 2; caudal 1 1/4, forked; pectoral 1 1/2; ventral 1 3/5.

Pale brown generally. Each scale along upper edge of back narrowly dusky. Cheek, maxillary and opercle with dusky tinge. Iris silvery-white. Fins all pale or whitish. Length 44 mm.

One in the Bishop Museum from Wake Island, obtained by the *Tanager* in July, 1923. One in the National Museum from Mangareva, but its dorsal spine not filamentous.

East Indies, Polynesia.

Amia erythrina (Snyder).

Apogon erythrinus Snyder: U. S. Fish Comm., Bull., vol. 22, p. 526, pl. 9, fig. 17, 1902 (1904) (type loc., Puako Bay, Hawaii; Honolulu; Hanalei Bay; Kauai; Laysan Island).—Jordan and Evermann: op. cit., vol. 23, pt. 1, pl. 34, fig. 2, 1903 (1905).

Amia erythrina Jordan and Evermann: U. S. Fish Comm., vol. 23, pt. 1, p. 217 (types; Samoa).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 245, 1905 (1906) (Pago Pago; Apia).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 102, 1912 (Mangareva, Paumotus).

Reddish-orange, scales edged with narrow band of deeper hue. Occiput and spot on opercle dusky. Fins immaculate. Length 35 mm. (Snyder)

Type of *Apogon erythrinus* from Puako Bay, 2 Hawaiian, 5 Samoa, and 1 from Mangareva, in the National Museum.

Differs from *Amia hypsclonotus* in dusky on occiput and opercles.

Amia laterale (Valenciennes).

Apogon lateralis Valenciennes: Mus. Hist. Nat. Paris, Nouv. Ann., vol. 1, p. 58, 1832 (type loc., Vanicolo).

Amia lateralis Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 246, fig. 40, 1905 (1906) (Apia).

Head 2 1/4 to 2 1/3; depth 2 2/5 to 2 3/4; D. VI-I, 9; A. II, 8, 1; scales (pockets) 21 in lateral line to caudal base; 8? scales transversely; snout 4 to 4 1/3 in head measured from upper jaw tip; eye 3 1/8 to 3 1/2; maxillary 2 to 2 1/8; interorbital 4 3/4 to 5.

Body rather deep, compressed. Caudal peduncle well compressed, least depth 1 1/3 to 1 1/2 in its length or 2 3/4 to 3 in total head length. Head width 2 2/5 to 2 2/3 in its length. Snout convex over surface and in profile, length 2/3 to 3/4 its width. Eye large, hind edge midway in head length, little longer than snout or interorbital. Mouth large, jaws nearly even. Maxillary extends opposite hind pupil edge, expansion 2 in eye. Teeth fine, in narrow bands in jaws, on vomer and palatines. Front nostril at first 2/5 in snout; hind nostril at last fifth in snout. Interorbital slightly depressed, save for low front median ridge. Preopercle edge minutely dentate, ridge entire. Gill rakers 4 + 16, lanceolate, 1 1/6 in gill filaments, which 2 3/4 in eye. Scales with 9 to 12 basal radiating striae, edge scalloped; apical denticles 60 to 78, transversely basal elements in 10 or 11 rows, though only 4 apical spiniferous; circuli fine. Third dorsal spine 2 1/4 to 2 1/3 in total head length; second dorsal ray 1 2/3 to 2; second anal spine 3 to 3 1/5; first anal ray 1 4/5 to 2; caudal 1 1/10 to 1 1/8, emarginate; pectoral 1 1/2 to 1 3/4; ventral 1 4/5 to 2 1/10.

Brownish generally, little paler below on head and abdomen. Sides of head and iris with silvery-white reflections. Faint brown streak along side of snout and then continued behind eye indistinctly across opercle; another more distinct extends from upper hind eye edge towards suprascapula. Narrow leaden streak from shoulder midway along side to caudal base and at latter, though separated, small round leaden spot, greatly less than pupil in size. Upper front edge of spinous dorsal blackish, rest of fin pale. Other vertical fins pale brownish, though both soft dorsal and anal with faint traces of subbasal dark line. Paired fins pale brownish. Length 60 to 75 mm.

In the Agassiz Museum 5 poorly preserved specimens from Ascension Island, Marshall Islands, obtained in 1877 by Rev. A. A. Strong. The National Museum has 8 from Apia.

Amia novae-guineae (Valenciennes).

Apogon novae-guineae Valenciennes: Mus. Hist. Nat. Paris, Nouv. Ann., vol. 1, p. 53, pl. 4, fig. 1, 1832 (type loc., New Guinea).

Amia novae-guineae Bleeker: Atlas ichth., vol. 7, p. 97, pl. (41) 319, fig. 3, 1873-76 (New Guinea).

Uniformly pale yellowish, head sprinkled with brown. Length 80 mm. (Bleeker)

India, East Indies.

Amia nigripinnis (Cuvier).

Apogon nigripinnis Cuvier: Hist. nat. Poiss., vol. 2, p. 113, 1828 (type loc., Pondicherry; Java).—Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 21, 1873 (Bonin Islands).—Day: Fishes of India, vol. 1, p. 60, pl. 16, fig. 6, 1875 (mentions type).

Grayish, with dark vertical band from before spinous dorsal base, passes downwards and backwards, widens and lost below whole length of pectoral. Second dark band from second dorsal base to lateral line and third over caudal peduncle. No black spots or streaks on head. Vertical fins black, except yellow dark-edged caudal. Length 132 mm. (Day)

India, East Indies, Bonin Islands.

Amia taenioptera (Bennett).

Apogon taenioptera Bennett: Zool. Soc. London, Proc., vol. 3, p. 206, 1835 (type loc., Mauritius).—Günther: Cat. fishes Brit. Mus., vol. 1, p. 235, 1859 (type).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 236, 1882 (New Guinea).

First dorsal with oblique black spots between spines. Second dorsal and anal with black band along base. Each caudal lobe with blackish streak. Outer margin of ventral blackish. (Günther)

Mauritius, New Guinea.

Amia maculifera (Garrett).

Apogon maculiferus Garrett: Cal. Acad. Sci., Proc., vol. 3, p. 105, 1863 (type loc., Hawaii).—Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 20, pl. 20, fig. c, 1873 (Hawaii).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 484, 1901 (Laysan).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 448, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 526, 1902 (1904) (between Maui and Lanai, 34 to 65 fathoms).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 527, 1906 (Hawaiian islands).

Amia maculifera Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 212, fig. 83, 1903 (1905) (Honolulu; Hilo).—Gilbert: op. cit., pt. 2, p. 617, 1903 (1905) (between Maui and Lanai, 34 to 65 fathoms).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 42, Dec., 1922 (Honolulu).

Three from Oahu and 2 from Oahu or Fiji obtained by the Wilkes Expedition, in the National Museum. Length 90 to 123 mm. Also 2 Hawaiian specimens obtained by the *Albatross*. In the Bishop Museum 22 specimens from Honolulu. I found 50 December 14, 1922, and 10 on December 10, in the Honolulu markets One Hawaiian specimen in the Agassiz Museum, 86 mm. Two Hawaiian specimens in the Academy obtained by J. K. Townsend.

Amia crassiceps (Garman).

Apogon crassiceps Garman: Mus. Comp. Zool., Bull., vol. 39, p. 230, 1903 (type loc., Suva Reef, Viti Levu, Fiji).

Amia crassiceps Jordan and Seale: (U. S.) Bur. Fish., Bull., 25, p. 239, fig. 32, 1905 (1906) (Apia).—Fowler and Bean: United States Nat. Mus., Proc., vol. 71, p. 14, 1927 (Tahiti).

Very close to *Amia maculifera* but color described reddish or yellowish, dark on crown and along back, with punctulations of dark along middle of side in hinder half of caudal region and on end of caudal fin. Fins light. (Garman)

Type of *Apogon crassiceps* in the Agassiz Museum, 31 mm. long. One from Apia in the National Museum.

Amia argyrogaster (Weber).

Apogon argyrogaster Weber: Leyden Mus., Notes,

vol. 31, p. 159, 1909 (type loc., West Coast of New Guinea).—Weber: Siboga Exped., vol. 65, p. 233, 1913 (near west coast of New Guinea, S. Lat. 1° 42′ .5, E. Long. 130° 47′ .5 in 32 m.).

D. VII-I, 9; A. II, 9; scales 22 in lateral line, 2 above, 6 below. Above brownish-gray with irregular dark blotches. Below silvery-white. First dorsal, base of second dorsal and outer half of ventral dark. Length 60 mm. (Weber)

New Guinea.

Amia tubulata (Weber).

Apogon tubulatus Weber: Leyden Mus., Notes, vol. 31, p. 160, 1909 (type loc., Sapeh Straits, Sumbawa; West Coast of New Guinea; Saleyer).—Weber: Siboga Exped., vol. 65, p. 234, 1913 (off west coast New Guinea, S. Lat. 1° 42′ .5, E. Long. 130° 47′ .5 in 32 m.).

D. VII-I, 9; A. II, 8; scales 24 in lateral line, 1 above, 8 below. Back and tail yellowish-gray with darker marblings. Flanks and below with silver sheen. Length 35 mm. (Weber)

East Indies.

Amia evermanni (Jordan and Snyder).

Apogon evermanni Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 28, p. 123, October 6, 1904 (type loc., Honolulu).

Amia evermanni Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 213, fig. 84, 1903 (1905) (type).

Scales small, 54 in lateral line, pores 25. Light red, body with 5 rather indistinct dark bands, none reaching ventral surface. Length 142 mm.

Type of *Apogon evermanni* in the National Museum.

Amia brachygramma (Jenkins).

Fowleria brachygrammus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 448, fig. 20, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 211, 1903 (1905) (Waikiki; Hilo).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 526, 1906 (Hawaii).

Fowleria brachygramma Snyder: U. S. Fish Comm., Bull., vol. 22, p. 526, 1902 (1904) (off Molokai and between Maui and Lanai, 23 to 73 fathoms).

Foa brachygramma Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 617, 1903 (1905) (off Molokai and between Maui and Lanai, 23 to 73 fathoms).—Jordan and Seale: U. S. Nat. Mus., Proc., vol. 28, p. 780, fig. 5, 1905).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).

Apogon auritus (non Cuvier) Streets: U. S. Nat. Mus., Bull. 7, p. 72, 1877 (Honolulu).

Foa fo Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 248, fig. 42, 1905 (1906) (type loc., Apia, Samoa).

Head 2 1/2; depth 2 1/2; D. VIII-I, 9; A. II, 8; scales 9 in upper section of lateral line, 12 in lower section to caudal base and 2 more on latter; 1 scale above lateral line, 5 below; snout 4 in head measured from upper jaw tip; eye 2 4/5; maxillary 1 3/4; interorbital 4 1/3; third dorsal spine 2 1/10; second anal spine 3; first anal ray 2 1/8; least depth of caudal peduncle 2 1/3; caudal 1 1/2; pectoral 1 3/4; ventral 1 1/3. Body comparatively short, deep, profiles alike. Mouth moderately oblique. Mandible slightly protrudes, with symphyseal tubercle. Maxillary reaches hind eye edge. Gill rakers 1, 1+7, IV, slender, longest 2/5 of eye. Cheek scales in 2 rows. Caudal rounded. Pectoral to soft dorsal origin. Brownish.

On October 15, 1922, over 40 specimens were obtained at Pearl City, Oahu. It was abundant in the clusters of pale blue sponges about the piers. Caught by scooping up sponges, hydroids, etc., though only 2 or 3 captured at one lift. When freshly caught dusky generally. Five darker vertical bands, much narrower than interspaces and very distinct in young, fading with age. Spinous dorsal and ventral largely dusky to blackish. Pectoral pinkish. Soft dorsal, anal and caudal ruddy to pink, fading yellowish in alcohol. Iris slaty. All adult specimens had very obscure traces of dark vertical bands, though each scale on trunk with dark narrow dusky edge. Opercle obscurely blackish. On November 12, 1922, took 50 more specimens. The Bishop Museum contains 2 specimens obtained at Honolulu by J. W. Thompson in 1910. In the National Museum the type *Fowleria brachygrammus* Jenkins and 3 from Hawaii obtained by Henderson and Bartsch in 1920. The Academy contains 2 Hawaiian specimens from J. K. Townsend and 2 from W. H. Jones.

Jordan and Jordan state it is "scarce on the reefs." Quite the reverse is true as it is very abundant, though local.

Amia vaiulae (Jordan and Seale).

Foa vaiulae Jordan and Seale: Bur. Fish., Bull., vol. 25, p. 249, fig. 43, 1905 (1906) (type loc., Apia, Samoa).

Apogon vaiulae Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 278, 1911 (Suva, Fiji).

Differs from *Amia brachygramma* only in the absence of broad obscure dark cross bands. The type was about 30 mm. long.

One from Suva in the National Museum.

Mionorus waikiki (Jordan and Evermann).

Apogonichthys waikiki Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 179, 1902 (1903) (type loc., Waikiki, near Honolulu).—Snyder: op. cit., p. 526, 1902 (1904) (between Maui and Lanai, 28 to 43 fathoms).—Jordan and Evermann: op. cit., vol. 23, pt. 1, pl. 35, 1903 (1905) (type).

Mionorus waikiki Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 210, 1903 (1905) (type).—Gilbert: op. cit., pt. 2, p. 617, 1903 (1905) (between Maui and Lanai, 28 to 43 fathoms).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 279, 1911 (Arhno Atoll, Marshalls).

Head 2 3/4; depth 3; D. VII-I, 8; A. II, 7; scales 22 in lateral line to caudal base and 2 more on latter; 2 scales above lateral line, 6 below; 5 predorsal scales to occiput; snout 4 1/3 in head; eye 3 1/2; maxillary 1 7/8; interorbital 5 1/2.

Body ovoid, deepest at spinous dorsal origin. Least depth of caudal peduncle 2 in head. Head width 2 1/8 in its length. Snout conic, length half its width. Eye large, twice length of snout, hind edge about midway in head length. Mouth large, jaws even. Maxillary extends back opposite hind eye edge, expansion 1 2/3 in eye. Teeth in narrow band in each jaw, palate apparently entire. Tongue elongate, narrow, smooth, free in front. Interorbital level. Preopercle ridge entire, also edge. Opercle spinescent. Gill rakers 2+8, IV, lanceolate, about 2/3 of gill filaments, which equal eye. Scales large, firmly adherent, little smaller on caudal base. Lateral line of simple tubes, concurrent with dorsal profile of back. Scales with 9 to 14 basal radiating striae; apical denticles 28 to 40; circuli fine. Spinous dorsal lower than soft dorsal, third spine 2 in head, fin entirely separated from soft fin; first branched dorsal ray 1 9/10; spinous anal inserted opposite soft dorsal

origin, second spine 2 7/8; caudal rounded, 1 1/2; pectoral reaches slightly beyond anal origin, 1 2/5 in head; ventral inserted slightly before pectoral origin, fin 7/8 to anal, 1 4/5 in head.

Dull brown generally, dusted darker. Vertical fins blackish, with large black ocellus over last third of fin and edges of soft dorsal and anal whitish. Pectoral pale brown, with about 8 dull transverse brownish cross-bands. Ventral dusky.

A very small specimen, about 30 mm. long, obtained by Alvin Seale at Guam in 1901, in the Bishop Museum. It differs from the original account and figure in that the last half of the spinous dorsal has a large black blotch, embracing nearly all that extent of the fin as an ocellus and the other vertical fins are all white edged. In the National Museum 1 young from Arhno, Marshall Islands, and the type of *Apogonichthys waikiki*.

Mionorus graeffii (Günther).

Apogon graeffii Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 22, pl. 20, fig. E, 1873 (type loc., Boston Island, Marshall Group).

Apogon graeffi Streets: U. S. Nat. Mus., Bull. 7, p. 101, 1877 (Samoa).

Mionorus graeffei Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 247, fig. 41, 1905 (1906) (Apia, Pago Pago).

Known by the greatly elevated spinous dorsal with second spine about 1 1/2 in head and body without caudal. Largely uniform, body without markings.

One obtained by the Wilkes Expedition at Fiji, about 40? mm. long. Also 1 received from Samoa through Steinberger. Both in the National Museum.

Apogonichthys auritus (Valenciennes).

Apogon auritus Valenciennes: Hist. nat. Poiss., vol. 7, p. 332, 1831 (type loc., Mauritius).—Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 23, 1873 (Tahiti; Yap).—Streets: U. S. Nat. Mus., Bull 7, p. 100, 1877 (Samoa).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 236, 1882 (New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 76, 1900 (1901) (Guam).—Weber: Siboga Exped., vol. 65, p. 232, 1913 (Galewo Straits, west New Guinea).

Apogonichthys auritus Schmeltz: Mus. Godeffroy, Cat. 4, p. 13, 1869 (Samoa).—Schmeltz: op. cit., Cat. 5, p. 22, 1874 (Samoa; Tahiti).—Fowler: B. P. Bishop Mus., Bull, 22, p. 8, 1925 (Guam).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 13, 1925 (Wake Island).

Apogon (Apogonichthys) auritus Peters: Akad. Wiss. Berlin, Monatsb., p. 831, 1876 (1877) (New Guinea).

Apogon punctulatus Rüppell: Neue Wirbelth., Fisch., p. 88, pl. 22, fig. 4, 1835 (type loc., Massaua, Red Sea).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 278, 1911 (Vavau, Tonga).

Apogon roseipinnis Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).

Apogonichthys variegatus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 32, 1905 (1906) (Apia and Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 22, p. 32, 1925 (Samoa).

Apogonichthys marmoratus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 250, fig. 44, 1905 (1906) (Pago Pago; Apia).

Fowleria marmorata Fowler and Silvester: Carnegie Mus., Marine Pap., p. 117, 1922 (Pago Pago).

Apogonichthys isostigma Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 251, fig. 45, 1905 (1906) (type loc., Apia).

Fowleria isostigma Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 104, 1912 (Mangareva, Paumotus; types).

Head 2 1/3; depth 2 2/3; D. VI-I, 9; A. II, 8; scales 19 in lateral line to caudal base and 3 more on latter; 2 scales above lateral line, 6 below; 7 predorsal scales; head width 2 1/2 its length; snout 4 in head measured from upper jaw tip; eye 3; maxillary 1 7/8; interorbital 6 1/2. Gill rakers III, 2+6, V, slenderly clavate, long as gill filaments or 3 in eye. Scales with 14 or 15 basal radiating striae; apical denticles 80 to 83, basal elements in 2 series. Maxillary not quite reaching opposite hind eye edge. Villiform teeth in bands in jaws and patch on vomer; none on palatines (contrary to Seale's statement). Preopercle edge and ridge entire. Largely dull brown, lower surface but little paler, each scale with traces of dusky spot. Edge of spinous dorsal dusky to blackish. Large black ocellus, edged narrowly white, about size of pupil, on opercle. Fins brownish. Caudal dusky terminally.

One in the Bishop Museum from Guam, 55 mm. long. Also one from Faté, New Hebrides. Five from Wake Island and 2 from Guam in 1923. In the National Museum 2 labeled "Honolulu" from T. H. Streets doubtless from Samoa, 1 Vavau, Tonga, and 3 from Samoa. Also Samoan specimen from Steinberger, 2 from Mangareva, and 3 by the Wilkes Expedition from "Fiji or Samoa." In the Agassiz Museum 2 from Mangareva, larger 76 mm., 2 from Pago Pago and 4 from Ascension Island, Marshall Islands, obtained in 1877. One in the Academy from Pago Pago.

Jordan and Seale state that the specimen described above from Guam must be the same as their *Apogonichthys isostigma*. There are, however, no characters by which *A. isostigma* may be separated from *A. auritus*.

Red Sea and Mauritius to the East Indies, Micronesia and Tahiti.

Apogonichthys perdix Bleeker.

Apogonichthys perdix Bleeker: Nat. Tijds. Ned. Ind., vol. 6, p. 321, 1854 (type loc., Larantuka, Flores).—Fowler: B. P. Bishop Mus., Bull. 22, p. 8, 1925 (Guam).

Head 2 2/5 to 2 1/2; depth 2 3/4 to 2 4/5; D. VII-I, 9; A. II, 8; scales 18 or 19 in lateral line to caudal base and 2 more on latter, 2 above, 6 below; snout 4 to 4 1/5 in head from upper jaw tip; eye 2 1/4 to 3; maxillary 1 7/8; interorbital 3 3/4 to 5.

Body compressed, elongate-ovate, deepest at spinous dorsal base. Caudal peduncle strongly compressed, least depth 1 1/4 in its length or 2 2/3 in total head length. Head width 2 1/2 in its length. Snout convex, length 2/3 its width. Eye with hind edge midway in head length, much greater than snout or interorbital. Mouth large, mandible projecting. Maxillary reaches eye center or hind pupil edge; expansion 2 in eye. Teeth villiform, in bands in jaws and on vomer, none on palatines. Nostrils close together and close before eye. Interorbital depressed, with slight concavity each side of median line. Preopercle edge and ridge entire, sometimes former feebly serrated. Gill rakers 4+11 to 18, lanceolate, little longer than gill filaments or 2 1/2 in eye.

Scales with 7 to 10 basal radiating striae, edge scalloped, apical denticles 24 to 90, with 3 to 5 transverse

series of basal elements; circuli very fine. Third dorsal spine 2 1/8 in total head length, first ray 2; second anal spine 3, first ray 1 7/8; caudal 1 3/5, rounded convexly behind; pectoral 1 2/3; ventral 1 4/5.

Brownish, inclining to whitish below. Head and trunk with scattered darker brown pigment dots; on cheek and sides of head as minute light blue, dark edged, scattered ocelli. Iris slaty. Fins all pale to transparent, with darker fine cross lines of gray; spinous dorsal more or less dusky. Pectoral transparent, though all other fins barred. Length 42 to 50 mm.

One from Guam, obtained by Alvin Seale in 1900, and another by Hornbostel in 1923, in the Bishop Museum.

Bleeker had 3 specimens 40 to 47 mm. long from Flores and Buru. Mine agree in most every respect with Bleeker's except that the fins are immaculate. Under the microscope these show only faint traces of spots on the caudal base. Jordan and Richardson ([U. S.] Bur. Fish., Bull., vol. 27, p. 255, 1908) say "The original type of Apogonichthys Bleeker is *Apogonichthys perdix* Bleeker (Floris). This species has an incomplete lateral line, an entire preopercle and teeth on the palatines." Bleeker distinctly figures his species with a complete lateral line, exactly as in my specimens. Moreover the preopercle and smooth palate are as I have described above.

The species is an interesting addition to the ichthyfauna of Oceania.

Apogonichthys buruensis (Bleeker).

Apogon buruensis Bleeker: Nat. Tijds. Ned. Ind., vol. 11, p. 394, 1856 (type loc., Kajeli, Buru).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 255, 1883 (fresh waters of Normanby Island, New Guinea).

Golden yellow, with 2 brown longitudinal bands. Round black spot at caudal base. Fins yellowish rosy. A. II, 13 or 14. Length 64 mm. (Bleeker)

East Indies.

Archamia zosterophora (Bleeker) (fig. 40).

Apogon zosterophora Bleeker: Soc. Sci. Ind. Neerl., Act. (Manado), vol. 1, 36, 1856 (type loc., Manado, Celebes).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 235, 1882 (New Guinea).

Readily known by its bright golden color and broad black transverse band from soft dorsal base to postventral region. Small black spot at caudal base. Length 63 mm.

East Indies, Philippines.

Archamia lineolata (Cuvier).

Apogon lineolatus (Ehrenberg) Cuvier: Hist. nat. Poiss., vol. 2, p. 119, 1828 (type loc., Red Sea).

Archamia lineolata Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 252, pl. 38, fig. 1, 1905 (1906) (Pago Pago, Apia).—Fowler: B. P. Bishop Mus., Bull. 22, p. 32, 1925 (Samoa).

Apogon macropterus (Kuhl and Van Hasselt) Cuvier: Hist. nat. Poiss., vol. 2, p. 119, 1828 (type loc., Java).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 255, 1883 (New Guinea).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 18, p. 206, 1912 (Port Sandwich, New Hebrides).

Apogon argenteus Valenciennes: Mus. Hist. Nat., Nouv. Ann., p. 60, 1832 (type loc., Vanicolo).

Apogon bleekeri Schmeltz: Mus. Godeffroy, Cat. 4, p. 13, 1869 (Upolu).

Reddish yellow, with 23 red transverse streaks. Head and body dotted with brown, dots larger on sides of head. Black spot at caudal base. Fins uniformly pale. Length 93 mm.

In the Agissiz Museum 15 from Apia. Also 15 in the Academy from Apia.

Red Sea to East Indies, Micronesia, Samoa.

Cheilodipterus lineatus (Linné).

Perca lineata Linné: Systema nat., 10th ed., p. 293, 1758 (no type locality; habitat?).

Chilodipterus lineatus Pellegrin: Mus. Paris, Bull. 18, p. 206, 1912 (Port Sandwich, New Hebrides).

Paramia lineatus Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 105, 1912 (Mangareva, Paumotus).

Chilodipterus octovittatus Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 236, 1882 (New Guinea).

Chilodipterus macrodon Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1379, 1906 (Upolu).

Paramia macrodon Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 252, 1905 (1906) (Apia; Samoa).

Body with 14 to 16 dark lateral parallel streaks longitudinally.

Two in the National Museum from New Guinea, 3 from Apia and 1 from Mangareva.

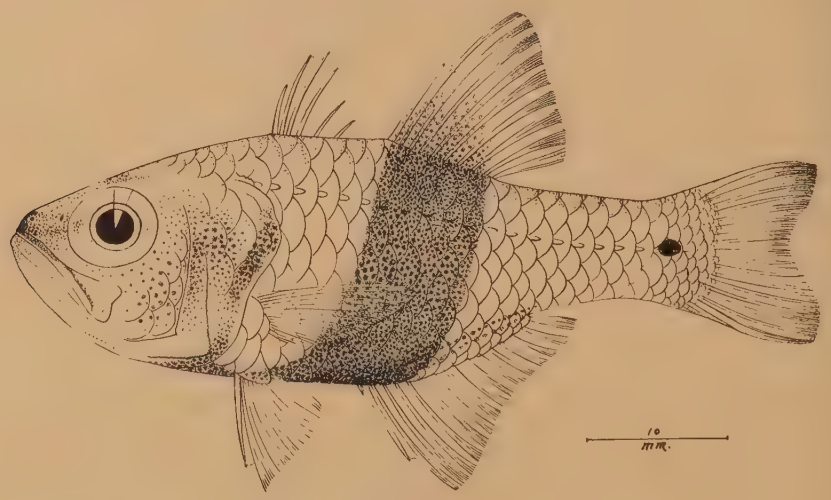

FIGURE 40.—Drawing of *Archamia zosterophora*.

Red Sea, East Africa, India, East Indies, Tuamotus.

Cheilodipterus quinquelineatus Cuvier.

Cheilodipterus quinquelineatus Cuvier: Hist. nat. Poiss., vol. 2, p. 124, 1828 (type loc., Society Islands).—Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 237, 1830 (Borabora).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 13, 1885 (Rubi, New Guinea).—Fowler: B. P. Bishop Mus., Bull. 22, p. 32, 1925 (Samoa).

Chilodipterus quinquelineatus Günther, Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 23, 1873 (Society Islands; Paumotus).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 12, 1877 (Tahiti).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 236, 1882 (New Guinea).—Pellegrin: Mus. Paris, Bull. 18, p. 206, 1912 (Port Sandwich, New Hebrides).

Paramia quinquelineata Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 33, 1906 (Raiatea, Society Islands; Nukuhiva, Marquesas).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 252, 1905 (1906) (Apia; Pago Pago).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 279, 1911 (Papiete, Tahiti; Vavau, Tonga).

Cheilodipterus popur Thiollière: Fauna Woodlark, p. 142, 1857 (type loc., Woodlark Island).

Sparoide popur (Montrouzier) Thiollière: Fauna Woodlark, p. 147, 1857 (name in synonymy).

Body with 3 to 5 dark lateral parallel streaks longitudinally.

In the Bishop Museum 1 from Nukuhiva, 7 Raiatea and 5 Faté. Largest 112 mm. In the National Museum 3 from New Guinea, 1 Papeete, 6 Apia. Two in the Agassiz Museum from Vavau. Two in the Academy from Apia.

Thiollière describes *Cheilodipterus popur* as silvery with 5 longitudinal violet lines each side of the body and a transverse yellow spot on each side at the beginning of the caudal. Length 102 mm.

Red Sea, East Africa, India, East Indies, Melanesia, Polynesia.

Cheilodipterus singapurensis Bleeker.

Cheilodipterus singapurensis Bleeker: Nat. Tijds. Ned. Ind., vol. 20, p. 452, 1859-60 (type loc., Singapore).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 116, 1913 (Beo, Majalibit Bay, Waigiu).

Differs from *Cheilodipterus quinquelineatus* in its more somber coloration, the dark longitudinal line similar, but not on head, and not so well defined. Fins slightly more obtuse. According to Bleeker reaches 149 mm.

East Indies.

Synagrops japonica (Steindachner and Döderlein).

Melanostoma japonicum (Döderlein) Steindachner and Döderlein: Akad. Wiss. Wien, Denk., vol. 1, pt. 48, p. 5, pl. 1, fig. 2, 1884 (type loc., Tokyo).

Synagrops japonica Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 13, 1925 (Lahaina, Maui).

Melanostoma argyreum Gilbert and Cramer: U. S. Nat. Mus., Proc., vol. 19, p. 416, pl. 39, fig. 3, 1897 (type loc., off Hawaiian islands in 295 to 298 fathoms).

Synagrops argyrea Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 618, 1903 (1905) (Pailolo Channel, off Oahu, off Maui, in 122 to 290 fathoms).—Fowler: B. P. Bishop Mus., Bull. 22, p. 8, 1925 (Guam).

Head 4; depth 3; D. IX-I, 10; A. II, 8; scales in lateral line 31+5. Eye longer than snout, 3 2/3 in head. Mouth extends below middle of eye, rather oblique, lower jaw somewhat projecting. Uniform blackish. Length 228 mm. (Günther)

There are few characters in *Melanostoma argyreum* worthy of specific distinction. Small specimen in the Bishop Museum from Lahaina, Maui, June, 1923.

Japan, Hawaii.

Hynnodus atherinoides Gilbert.

Hynnodus atherinoides Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 618, pl. 79, 1903 (1905) (type loc., Pailolo Channel, Hawaii, in 284 to 290 fathoms).

Scepterias fragilis Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 45, pl. 2, fig. 2, December, 1922 (type loc., Honolulu).

Head 3 3/5; depth 6; D. VI-I, 8; A. 7; P. 16; V. I, 5; snout 3 3/4 in head; eye 3 1/6; maxillary 3; interorbital 5.

Body well compressed, elongate, tapering gradually from head. Caudal peduncle well compressed, its least depth 1/3 its length or 3 1/8 in total head length. Head width 2 4/5 in its length. Snout conic, about long as wide. Eye large, center at first 2/5 in head, greater than snout or interorbital. Mouth rather large, closed jaws about equal. Maxillary reaches front eye edge. Teeth not evident. Nostrils high, together, about last third in snout. Interorbital depressed, very slightly concave. Gill rakers 5+15, fine, very slender, long as gill filaments, which 1 4/5 in eye.

Body apparently with scales little developed. Course of lateral line indicated as narrow groove or line from shoulder to middle of caudal base. First dorsal inserted little nearer second dorsal than snout tip, front spines highest, second spine 2 in head. Soft dorsal inserted little nearer first dorsal than caudal base, first branched ray 1 4/5 in head. Anal opposite soft dorsal and similar. Caudal forked, 1 1/6 in head; pectoral 1 7/8; ventral 1 3/4.

Seal-brown on back, becoming little paler below. Sides of head and trunk covered with many crowded, thick-set, variable dusky pigment dots. Caudal base blackish, fins otherwise all pale, without markings. Iris dull slaty. Length 33 mm.

One in the Bishop Museum, obtained at Lahaina, Maui, in June, 1923, by the Tanager Expedition. It differs a little from Gilbert's description in fewer fin rays and the apparent absence of anal spines. Likely these are variants of age.

There is little doubt but that *Scepterias fragilis* is a synonym.

Ariomma lurida Jordan and Snyder.

Ariomma lurida Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 943, 1904 (type loc., Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 217, pl. 37, 1903 (1905) (types).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 35, December, 1922 (Honolulu).

Ariomma evermanni Jordan and Snyder: (U. S.) Bur. Fish., Bull., vol. 26, p. 209, fig. 1, 1906 (1907) (type loc., Honolulu).

Eight in the Bishop Museum from Honolulu, 152 to 279 mm. Two in the National Museum from Honolulu as *Ariomma evermanni*, one type.

I cannot see that *Ariomma evermanni* really represents a distinct species. Its alleged shorter snout, smaller head and eyes, shorter gill rakers and larger scales are undoubtedly variants. The outline figure shows a much smaller eye than

usual, though I have specimens with equally long pectorals as the typical *Ariomma lurida* in which the adipose eyelid would allow of various ocular computations.

AMBASSIDAE

Ambassis ambassis (Lacépède).

Centropomus ambassis Lacépède: Hist. nat. Poiss., vol. 4, pp. 252, 282, 1802 (type loc., Seas and fresh waters of Mauritius and Reunion).

Ambassis commersonii Schmeltz: Mus. Godeffroy, Cat. 4, p. 13, 1869 (Upolu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 255, 1883 (Milne Bay in fresh water, New Guinea).

Ambassis macracanthus Macleay: Linn. Soc. New South Wales., Proc., vol. 7, p. 235, 1882 (New Guinea).

Head 2 3/5; depth 2 1/2; D. VII, I, 9 to 11; A. III, 9 or 10; scales 30 to 33, 4 above, 7 to 9 below; eye 3 to 3 3/5 in head. Double lower preopercle edges and preorbital serrated, interopercle entire. Three rows of cheek scales. Silvery. Bright silvery line from eye to caudal fin. Second membrane of spinous dorsal dusky. Length 153 mm.

In the National Museum 1 from Fiji, 68 mm. long, obtained by the Wilkes Expedition.

Red Sea, India, East Indies, Samoa.

Ambassis miops Günther.

Ambassis miops Günther: Zool. Soc. London, Proc., p. 655, 1871 (type loc., Rarotonga).—Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 18, 1873 (type).—Weber and Beaufort: Nova Caledonia, Saras. Roux, vol. 2, pt. 1, p. 31, 1915 (Oubatche River, Bondé).

Ambassis lafa Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 253, fig. 46, 1905 (1906) (type loc., Vaisigano River, Apia, Samoa).—Fowler: B. P. Bishop Mus., Bull. 22, p. 32, 1925 (Samoa).

Head 2 3/5; depth 2 4/5; D. VII, I, 9, 1; A. III, 10, 1; scales 30? in lateral line to caudal base, 3 above, 7? below, 14 predorsal; snout 4 1/2 in head from snout tip; eye 2 7/8; maxillary 2 1/3; interobital 3 1/2.

Body ovoid, compressed. Head deep, compressed. Snout much wider than long. Eye large, greater than snout. Mouth obliquely vertical, lower jaw protruding. Maxillary extends little beyond front of eye, little expanded. Teeth villiform, in bands in jaws and on vomer. Preorbital and lower preopercle edges finely denticulated. Gill rakers 8+21, lanceolate, slender, longest 3/5 of orbit. Rather small scales crowded along vertical fin bases. Cheek with 2 rows of scales. Lateral line arched anteriorly or until over rayed anal origin. Second dorsal spine 2 1/3 in head; first dorsal ray 2; third anal spine 2; first anal ray 2; caudal 1, deeply forked; pectoral 1 1/4, nearly reaches origin of third anal spine; ventral 1 2/5, inserted little before pectoral.

Brownish, back dusted and specked with deeper. Jaws dotted with brown. Fins grayish, dusted brown on dorsals and caudal. Iris dusky above.

In the Academy 16 from Apia, 35 to 87 mm. long. Three have 11 branched anal rays, 13 have 10 and they are among the smaller ones. As Jordan and Seale give 11 it would appear 10 is more likely. Gill rakers 11+23. Scales in lateral line about 30; basal striae 12 or 13. In the young the dorsal spines much longer and depress back at least 3/4 spine of soft dorsal. Alcoholic specimens further differ in dark median lateral streak or line extending level with middle of eye to caudal base. Interopercle edge entire, except point ending behind at angle. In the Agassiz Museum 15 from Apia.

Ambassis dussumieri Cuvier.

Ambassis dussumieri Cuvier: Hist. nat. Poiss., vol. 2, p. 134, 1828 (type loc., Malabar).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 13, 1869 (Upolu).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 113, 1913 (Njanjef and Majalibit Bay, Waigiu).

Head 2 7/8; depth 2 2/5; D. VII, I, 9 or 10; A. III, 9 or 10; scales 27 to 29, above 3, below 8; lateral line interrupted after eighth to twelfth scale, occasionally ceases entirely. Double lower preopercle and suborbital edges serrated, interopercle entire. Two rows of cheek scales. Silvery, with bright longitudinal lateral band. Some brown spots on upper third of body in its front half. Blackish between second and third dorsal spines, also caudal edge black. Length 102 mm. (Day).

East Africa, India, East Indies, China, Samoa.

Ambassis interrupta Bleeker.

Ambassis interrupta Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 696, 1852 (type loc., Wahai, Ceram; Batavia, Java).—Weber: Nova Guinea, vol. 5, pt. 2, p. 245, 1908 (Merauke River mouth, South New Guinea).—Weber: op. cit., vol. 9, pt. 4, p. 574, 1913 (Sekå and Sermowai River).—Weber and Beaufort: Nova Caledonia, Saras. Roux, vol. 2, pt. 1, p. 31, 1915 (Oubatche River).

Ambassis interrupta var. *reticulatus* Weber: Nova Guinea, vol. 9, pt. 4, p. 574, 1913 (type loc., Merauke, Bivak Island, Sabang, Alkmaar, Rivierkamp, Verlaten Bocht).

Ambassis reticulatus Regan: Zool. Soc. London, Trans., vol. 20, pt. 6, p. 276, 1914 (Setakwa River, New Guinea).

Head 2 1/2; depth 2 1/6; D. VII, I, 9 or 10; A. III, 9 to 11; scales 26 to 28, 3 above, 12 below; lateral line interrupted. Double lower edge of preopercle serrated, interopercle with few denticles at angle and preorbital serrated. Two rows of cheek scales. Silvery, with narrow lateral band. Second dorsal spine bright orange, membrane behind to third spine black. Dark longitudinal band along either caudal lobe. Length 82 mm. (Day)

Two from New Guinea in the National Museum.

Andamans, East Indies, New Caledonia.

Ambassis nalua (Buchanan-Hamilton).

Chanda nalua Buchanan-Hamilton: Fishes of Ganges, pp. 107, 371, pl. 6, fig. 36, 1822 (type loc., fresh waters of lower Bengal).

Ambassis nalua Weber: Nova Guinea, vol. 5, pt. 2, p. 246, 1908 (Klipong River, Northern New Guinea).

Head 2 2/3; depth 2; D. VII, I, 10 or 11; A. III, 9 or 10; scales 26 to 28, 3 above, 12 below; eye 2 1/2 in head. Double lower preopercle edges, hind half of interopercle and preorbital serrated. Two rows of scales on cheek. Silvery, with burnished lateral band. Membranes between second and third dorsal spines dark. Dark longitudinal band along either caudal lobe. (Day)

One in the National Museum, labeled "Fiji or Oahu" may really be from the East Indies. It is about 85 mm. long and was obtained by the Wilkes Expedition.

India and East Indies.

Ambassis vaivasensis Jordan and Seale.

Ambassis vaivasensis Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 254, fig. 47, 1905 (1906) (type loc., Vaivase River, Apia, Samoa).—Fowler: B. P. Bishop Mus., Bull. 22, p. 32, 1925 (Samoa).

Head 2 1/3; depth 2 3/5; D. VII, I, 9, 1; A. III, 10, 1; scales 24? in lateral line to caudal base and 2

more on latter; 3 scales above lateral line, 7 below; predorsal scales 14; snout 5 1/8 in head from snout tip; eye 3; maxillary 2 4/5; interorbital 4.

Body ovoid, compressed. Least depth of caudal peduncle 2 2/3 in total head length. Head deep, upper profile indented above eye. Snout much broader than long. Eye greater than snout. Mouth oblique, lower jaw protruding. Maxillary extends but little beyond front of eye, little expanded. Teeth in villiform bands in jaws and on vomer. Preorbital and lower preopercle edges finely denticulated. Gill rakers 9+17, lanceolate, slender, half long as orbit. Rather small scales crowded along bases of vertical fins. Cheek with 2 rows of scales. Lateral line little arched, till over soft anal origin. Second dorsal 1 2/5 in head; first dorsal ray 1 9/10; third anal spine 2 1/4; first anal ray 2 1/10; caudal 1, deeply forked; pectoral 1 1/3, reaches spinous anal; ventral 1 3/5, inserted little before pectoral origin.

Brownish, back and above more or less dusted. Jaws brownish. Fins grayish, dusted brownish on dorsals and caudal. Iris dusky above. Membrane between second and third dorsal spines dusky.

Four in the Academy from Apia, 81 to 89 mm. long. The Agassiz Museum has 4 from Apia, largest 102 mm. One in the National Museum labeled "Fiji or Oahu" is more likely from Fiji? It was obtained by the Wilkes Expedition.

Ambassis urotaenia Bleeker.

Ambassis urotaenia Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 257, 1852 (type loc., Amboina; Wahai, Ceram).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 279, 1911 (Kusaie and Ponapé, Carolines; Suva, Fiji).—Weber: Nova Guinea, vol. 9, pt. 4, p. 574, 1913 (Faté River, Northern New Guinea).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 112, 1913 (Rabiai River, Waigiu).

Head 2 2/3; depth 2 1/2; D. VII, I, 9 or 10; A. III, 9 or 10; scales 27 or 28, 3 or 4 above, 10 below, lateral line broken below soft dorsal; eye 2 1/2 in head. Double lower preopercle edges and preorbital serrate, interopercle entire. One row of scales on cheek. Silvery, with burnished lateral band. Membrane of second and third dorsal spines black and dark longitudinal band along either caudal lobe. (Day)

In the Agassiz Museum 12 from Suva, 5 Kusai and 1 Ponapé.

Seychelles, Andamans, East Indies, Fiji.

Ambassis gigas Ramsay and Ogilby.

Ambassis gigas Ramsay and Ogilby: Linn. Soc. New South Wales, Proc., 2nd ser., vol. 1, p. 9, 1886 (type loc., Strickland River, New Guinea).—Weber: Nova Guinea, vol. 9, pt. 4, p. 576, fig. 31, 1913 (Varen River, Sabang, Lorentz River, Verlaten Bocht, Vander Sande River, Regen Island, Alkmaar, Bivak Island, Rivierkamp).

Head 2 3/4; depth 2 1/8; D. VII, I, 10 or 11; A. III, 9 to 11; scales 39 to 41, 5 or 6 above, 12 below; eye 3 2/3 in head from snout tip. Lower preopercle edges, preorbital and interopercle denticulate. Three rows of scales on cheek. Scales on upper half of body with dark streak longitudinally along juncture of each row of scales. Dark blotch on opercle above anteriorly. Length 280 mm. (Weber)

New Guinea.

Ambassis confinis Weber.

Ambassis confinis Weber: Nova Guinea, vol. 9, pt. 4, p. 577, 1913 (type loc., Kaiserin Augusta River, Hauptbivak and in mountains; Njao and Sermowai River).

Head 3; depth 2 1/2; D. VII, I, 10 or 11; A. III, 9 or 10; scales 44 to 46, 5 or 6 above, 12 or 13 below; eye 2 1/2 in head. Lower preopercle edges, preorbitals and interopercle denticulate. Three rows of scales on cheek. Yellowish or dark brown above, below whitish, separated by wide dark longtitudinal band. Tip of first dorsal black. Second dorsal and anal with irregular dark dots. Length 122 mm. (Weber)

Differs from *Ambassis gigas* in more scales in lateral line.

Ambassis papuensis Alleyne and Macleay.

Ambassis papuensis Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 266, pl. 5, fig. 4, 1876 (type loc., south shore of Hall Sound, British New Guinea).

Head 3; depth 3; D. VII, I, 8; A. III, 9; scales large, lateral line arched, ends over anal; eye 3 (in figure). Double lower preopercle edge and infraorbitals strongly denticulate, interopercle entire. Cheek apparently with 2 rows of scales. Reddish yellow, with silvery median band. Minute black dots on back. Little black on first dorsal and caudal, latter moderately forked. (Alleyne and Macleay)

Ambassis brevipinnis Kner.

Ambassis brevipinnis Kner: Akad. Wiss. Wien, Sitz., vol. 58, pt. 1, pp. 27, 298, pl. 1, fig. 2, 1868 (type loc., South Pacific).

Head 2 2/3; depth 2 7/8; D. VII, I, 8; A. II, 8; scales 25, 4 above, 6 below; eye 3 in head from snout tip. Lower preopercle edges, interopercle and suborbitals denticulate. Two rows of cheek scales. Silvery, with dark longitudinal streak along lateral line. Length 150 mm. (Kner)

Described from a specimen without definite locality, which differs from all the known species in the obtuse caudal fin, this only very slightly emarginate behind.

Tetracentrum apogonoides Macleay.

Tetracentrum apogonoides Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 256, 1883 (type loc., Goldie River, and other fresh water streams, New Guinea).

Head 3; depth 2; D. IX, 10; A. IV, 9; scales 30, 4 above, 7 below; eye large, equals interorbital. Mouth oblique, lower jaw prominent. Maxillary reaches first third in eye. Teeth villiform, outer series enlarged. Inner double preopercle edge strongly toothed at angle and outer very strongly denticulated along its entire edge. Suborbital, preorbital, interopercle and subopercle denticulated on lower edges. No opercular spine. Scales cover whole body except top of head and single row along bases of soft dorsal and anal. Caudal somewhat long, lobes rather produced. Uniform dull silvery gray. Young with black blotch above anal spines. Black vitta on hind part of lateral line. Apparently black opercular blotch present. Length 178 mm. (Macleay)

Differs from the other genera in having 4 anal spines.

New Guinea.

KUHLIIDAE

An excellent revision of the genus *Kuhlia* is given by Regan (Zool. Soc. London, Proc., pp. 374-381, 1913), which is followed here.

Kuhlia rupestris (Lacépède).

Centropomus rupestris Lacépède: Hist. nat. Poiss., vol. 4, pp. 252, 273, 1802 (type loc., Gol de l'isle de la Reunion).

Dules rupestris Schmeltz: Mus. Godeffroy, Cat. 5, p. 22, 1874 (Viti Levu; Upolu).—Günther: Rept. voyage "Challenger," vol. 1, p. 34, 1880 (Ovalau; Fiji).—

Pellegrin: Mus. Paris, Bull. 4, p. 229, 1898 (Saypan, Marianas).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 517, 1906 (Tahiti; Samoa).—Pietschmann: Nassau. Ver. Naturk. Jahrb (Wiesbaden), pt. 66, p. 197, 1913 (Kaiser-Wilhelm's Harbor, German New Guinea).

Kuhlia rupestris Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 36, 1895 (Pelew Islands; Ponapé; Solomons; New Hebrides; Fiji; Tonga).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., pp. 520, 527, 1900 (Tahiti, Samoa).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 75, 1900 (1901) (Guam).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 255, 1905 (1906) Vaisigano River above Apia).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 354, 1906 (Tahiti).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 283, 1911 (Kusaie, Carolines).—Regan: Zool. Soc. London, Proc., p. 375, 1913 (Indo-Pacific to Paumotu).—Weber and Beaufort: New Caledonia, Saras. Roux, Zool., vol. 2, pt. 1, p. 28, 1915 (Oubatche; Tao River; Ngoi River; Douencheur River).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 8, 32, 37, 1925 (Guam, Samoa, Tahiti).

Dules guamensis Valenciennes: Hist. nat. Poiss., vol. 7, p. 357, 1831 (type loc., Guam).—Hombron and Jacquinot: Voyage "Astrolabe" et "Zeleé," Zool., vol. 3, p. 42, pl. 3, fig. 1, 1853 (type).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 257, 1883 (fresh water of Normanby Island, New Guinea).

Dules vanicolensis Valenciennes: Hist. nat. Poiss., vol. 7, p. 359, 1831 (type loc., Vanicolo).—Hombron and Jacquinot: Voyage "Astrolabe" et "Zeleé," Zool., vol. 3, p. 42, pl. 3, fig. 1, 1853 (type).

Therapon unicolor (non Günther) Kner: Akad. Wiss. Wien., Sitz., vol. 58, pt. 1, p. 300, pl. 2, fig. 4, 1868 (Kandavu, Fiji).

Kuhlia rupestris hedleyi Ogilby: Linn. Soc. New South Wales, Proc., vol. 22, p. 767, 1897 (type loc., New Caledonia).

Head 2 7/8 to 3; depth 2 3/4 to 2 5/6; D. IX, I, 11, 1; A. III, 10, 1; scales 39 or 40 in lateral line to caudal base and 4 to 6 more on latter; 5 scales above lateral line, 9 below; 9 or 10 predorsal scales; snout 3 4/5 to 4 in head from upper jaw tip; eye 3 2/3 to 3 4/5; maxillary 2 1/6 to 2 1/5; interorbital 3 to 3 1/4 Head width 1 3/5 to 1 7/8 in total head length. Gill rakers 9+17, lanceolate, longer than gill-filaments or 1 3/4 in eye. Scales with 8 to 12 basal radiating striae, of which 2 or 3 imperfect; apical denticles 104 to 113, with 4 or 5 rows of basal elements; circuli very fine. Dusky brown above, each row of scales with little darker band. Sides and below paler to whitish. Vertical fins all deeper brownish basally and more or less mottled. Pectoral and ventral pale.

The Bishop Museum has 3 from Agaña, Guam. Also 2 from Guam in 1923. One in the National Museum from Hawaii, obtained by the Wilkes Expedition, 127 mm. long. Others through the Bureau of Fisheries, 2 from Apia and 3 Kusaie. The Agassiz Museum has 1 from Kusaie and 7 from Ebon Island in the Marshalls, largest 228 mm. In the Academy 1 from Samoa.

Reunion, East Africa, East Indies, Tahiti and Tuamotus.

Kuhlia caerulescens Regan.

Kuhlia caerulescens Regan: Zool. Soc. London, Proc., p. 376, fig., 1913 (type loc., Stirling Island, Solomons).

Kuhlia rupestris (part) Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 36, 1895 (Stirling Island).

Maxillary reaching opposite center of eye. Gill rakers 7 on lower branch of first arch. Bluish silvery, with dark spot at base of each scale. Cheeks and opercles spotted. Soft dorsal and anal with longitudinal bands or series of spots. Caudal with broad dark bar posteriorly. Length 290 mm. (Regan)

Solomon Islands.

Kuhlia urvillii Boulenger.

Kuhlia urvillii Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 38, 1895 (on Urville) ("probably some South Pacific islands").

Dules marginatus (part) Hombron and Jacquinot: Voyage "Astrolabe" et "Zeleé," Zool., vol. 3, p. 42, 1853.

Like *Kuhlia marginata*, but the last dorsal spine longest or 2/3 of head and maxillary extends to hind part of eye. Length 160 mm.

Kuhlia marginata (Cuvier).

Dules marginatus Cuvier: Hist. nat. Poiss., vol. 3, p. 87, pl. 52, 1829 (type loc., Java).—Valenciennes: Hist. nat. Poiss., vol. 7, p. 356, 1831 (Vanicolo).—Günther: Cat. fishes Brit. Mus., vol. 1, p. 268, 1859 (Fiji).—Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 24, 1873 (Fiji; Society Islands; Gilberts; Hawaii).—Günther: Rept. voyage "Challenger," vol. 1, pp. 34, 58, 59, 1880 (Ovalau, Fiji; Papeuriri, Tahiti; Hilo; Honolulu).—Fowler: Acad. Nat. Sci. Philadelphia, p. 517, 1906 (Tahiti).

Moronopsis marginatus Streets: U. S. Nat. Mus., Bull. 7, p. 71, 1877 (Waialua, Oahu).

Kuhlia marginata Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 38, 1895 (Solomons; Bonham Island; Savaii; Fiji; Viti Levu; Tahiti).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 520, 1900 (Tahiti).—Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 129, 1902 (1903) (Marcus Island).—Jordan and Seale: U. S.) Bur. Fish., Bull., vol. 25, p. 255, 1905 (1906) (Vaisigano River, Apia).—Weber: Nova Guinea, vol. 5, pt. 2, p. 244, 1908 (Klipong River and Mbai on Humboldt Bay, northern New Guinea).—Weber: Nova Guinea, vol. 9, pt. 4, p. 570, 1913 (Mbai River).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 110, 1913 (Lamlam River, Fofak Bay, North Waigiu).—Weber and Beaufort: New Caledonia, Saras. Roux, Zool., vol. 2, pt. 1, p. 30, 1915 (Oubatche, Douencheur River).—Evermann and Seale: Copeia, no. 119, p. 71, June 16, 1923 (Apia).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 32, 37, 1925 (Samoa; Tahiti).—Fowler and Bean: U. S. Nat. Mus., Proc., vol. 71, p. 14, 1927 (Tahiti).

Kuhlia marginatus Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).

Dules mato Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 223, June 18, 1830 (type loc., Matovai River, Venus Point, Tahiti).—Hombron and Jacquinot: Voyage "Astrolabe" et "Zeleé," Zool., vol. 3, p. 43, pl. 3, fig. 4, 1853 (type).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 512, 1906 (Hawaiian islands; Tahiti).

Dules malo Valenciennes: Hist. nat. Poiss., vol. 7, p. 360, 1831 (Matavai River, Tahiti).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 13, 1869 (Viti Levu).

Kuhlia malo Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 40, 1895 (Vitu Levu; Tahiti).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., pp. 502, 570, 1900 (Hawaii; Tahiti).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 483, 1901 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 447, 1902 (1903) (Honolulu).—Snyder: op. cit., p. 526, 1902 (1904) (Puako Bay, Hawaii; Hanalei Bay, Huleia River, Waimea River, Kauai; Laysan Island; off Molokai).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 207, 1903 (1905) (Honolulu; Moanalua; Heeia; Waialua; Hilo; Kailua).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 354, 1906 (Tahiti).—Jordan and Dickerson: op. cit., vol. 34, p. 610, 1908 (Suva, Fiji).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 280, pl. 2, fig. 2, 1911 (Tipaerui River, Papeite, Society Islands).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 41, Dec. 1922 (Hawaii).

Dules leuciscus Jenyns: Voyage of "Beagle," Zool. p. 17, 1842 (type loc., Matuvui River, Tahiti).

Moronopsis ciliatus Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).

Dules ciliatus Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 237, 1882 (Cuppa Cuppa, New Guinea).

Dules papuensis Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 257, 1883 (type loc., Goldie River, in fresh water, New Guinea).

Kuhlia maculata Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 281, pl. 3, fig. 1, 1911 (Kusaie, Carolines).

Head 2 7/8 to 3 1/3; depth 2 2/5 to 2 9/10; D. X, 11, 1; A. III, 11, 1 or 12, 1; scales 38 to 47 in lateral line to caudal base and 5 more on latter; 6 scales above lateral line, 9 below; 11 or 12 predorsal scales; snout 3 7/8 to 4 1/4 in head; eye 2 3/4 to 3 1/5; maxillary 2 1/4 to 2 1/2; interorbital 3 1/4 to 3 3/5.

Body elongately fusiform. Least depth of caudal peduncle 2/3 its length. Head width 2 to 2 1/10 in its length, profiles alike. Snout broad. Eye with hind edge little behind middle in head length. Mouth large, superior, mandible protruding. Maxillary reaches pupil, expansion 3/5 of pupil. Teeth fine, minute, in bands in jaws, on vomer and palatines. Nostrils close, near eye. Interorbital broad, convex. Preopercle and lower preorbital edge finely serrate. Gill rakers 10 to 12 + 20 to 27, lanceolate, nearly 3/5 of eye and gill filaments 1/3 of eye. Scales on chest and caudal peduncle much smaller, more so along vertical fin bases, where forming detached sheaths. Cheek scales in 4 rows. Fourth and fifth dorsal spines longest, fin edge deeply notched. Soft dorsal higher forward, soft anal similar. Anal spines graduated to last, which longest. Caudal emarginate. Pectoral small, pointed. Ventral inserted just behind pectoral base, spine 2/3 its length, depressed fin little beyond vent but not quite to anal.

Light brown above, pale to whitish below, everywhere more or less silvered. Back, caudal peduncle above and caudal marked with many large rich brown blotches or spots, forming somewhat regular submarginal band behind. Fins pale. Base of spinous dorsal brownish, somewhat of tint of spots on back, then above broad median area of milky-white. Median brownish area on soft dorsal, another narrowly basally. Edges of soft dorsal and anal, and hind caudal edge dusky brown. Spinous anal membranes milky white, also front edge of soft dorsal and anal. Soft anal with nearly median series of brown spots, most distinct forward. Pectoral largely brownish. Ventral with edge of first ray milky, then brownish streak on same ray. Iris brassy white.

In the Bishop Museum 1 from Marcus Island and 1 from Tahiti in fresh water, latter 184 mm. long. The Agassiz Museum has 2 from Tipaerui, Papeete, 2 Kusaie, 2 Apia and 1 Society Islands, the last through Andrew Garrett. In the National Museum 6 from the "Hawaiian islands"? though more likely from Taumotu, 3 Tahiti, 1 Fiji, 1 Samoa, and 1 without locality which may be Samoan? All these obtained by the Wilkes Expedition. In the *Albatross* collections 6 from Kusaie and 12 from Tipaerui River in Tahiti, 1 Puako Bay, 1 Hawaiian. From the Bureau of Fisheries 217 Hawaiian and 6 Apia. From W. H. Jones 26 from Samoa. From T. H. Streets 2 from Wailua, Oahu. The Academy has 4 from Tahiti, 2 Apia, 3 Hilo, 3 Maui, 3 Hawaiian islands, and 5 without locality though most likely Hawaiian? I found nearly 700 specimens in the markets of Honolulu during November and December, 1922, and January, 1923.

Jordan and Jordan say "although the name *Dules mato* of Lesson, 1830, has apparent priority over *Dules malo* of Cuvier and Valenciennes, nevertheless the fact that Lesson quotes the latter in synonymy with the correct page shows that his report on the Voyage de la Coquille is later in date than vol. 3 of the *Histoire des Poissons.*" While this may be a very apparent assumption, the quotation referred to undoubtedly pertains to the simple reference in Cuvier's Regne Animal (2nd ed., p. 147, 1829). Now, in that work it will be seen that *Dules malo* is simply a *nomen nudum,* and therefore if it is to be used must certainly date from Lesson (June 18, 1830). It is no argument that the quotation of Valenciennes establishes priority, as the vol. 7 in question may really not have appeared until after the date of Lesson.

Kuhlia boninensis (Fowler) (fig. 41).

Dules marginatus boninensis Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 510, fig. 1, 1906 (type loc., Bonin

FIGURE 41.—Drawing of *Kuhlia boninensis.*

Islands [between N. Lat. 26° 30'-27° 44' and W. Long. 140°-143° in North Pacific].

Kuhlia boninensis Regan: Zool. Soc. London, Proc., p. 378, 1913 (Tahiti).

Dules marginatus (non Cuvier) Kittlitz: Denkw. Reis. Mikronesien, vol. 2, p. 188, 1858 (Bonin Islands).

Kuhlia caudovittata (part) Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 41, 1895 (Tahiti).

Type of *Dules marginatus boninensis* in the Academy.

Seven specimens from the Bonin Islands obtained by William Stimpson, in the National Museum. These show the lower gill rakers in all about 22. Length of largest 216 mm.

Kuhlia munda (De Vis).

Herops munda De Vis: Linn. Soc. New South Wales, Proc., vol. 9, p. 392, 1885 (type loc., Cardwell).—McCulloch: Australian Mus., Records, vol. 13, pt. 2, p. 35, 1920 (types of *Dules nitens* Ramsay and Ogilby, from Port Moresby).

Dules humilis De Vis: Linn. Soc. New South Wales, Proc., vol. 9, p. 396, 1885 (type loc., Queensland).

Kuhlia humilis Regan: Zool. Soc. London, Proc., p. 380, fig. 69a (head) 1913 (Fiji).—Weber and Beaufort: Nova Caledonia, Saras. Roux, Zool., vol. 2, pt. 1, p. 29, 1915 (Oubatche).

Dules nitens Ramsay and Ogilby: Linn. Soc. New South Wales, Proc., 2nd ser., vol. 2, p. 4, 1887 (1888) (type loc., southeast coast of New Guinea).

Kuhlia malo (part) Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 40, 1895 (Fiji).

Kuhlia proxima Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 282, pl. 3, fig. 2, 1911 (type loc., Fiji).

Differs from *Kuhlia boninensis* in the more numerous gill rakers, 25 on lower branch of first arch. From *Kuhlia sandvicensis* it differs in the median caudal rays longer or more than half long as longest.

Type of *Kuhlia proxima* in the Agassiz Museum. One specimen from Fiji in the National Museum.

New Guinea, Queensland and Fiji.

Kuhlia sandvicensis (Steindachner).

Moronopsis argenteus var. *sandvicensis* Steindachner: Akad. Wiss. Wien, Sitz., vol. 74, pt. 1, p. 157, 1876 (1877) (type loc., Hawaiian islands).

Moronopsis sundvicensis Steindachner: Akad. Wiss. Wein, Sitz., vol. 96, pt. 1, p. 56, pl. 1, fig. 1, 1887 (1888) (Hawaiian islands).

Kuhlia sandvicensis Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 283, 1911 (Makemo and Makatea, Paumotus).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 106, 1912 (Mangareva, Paumotus).—Regan: Zool. Soc. London, Proc., p. 381, 1913 (Hawaiian islands; Tahiti).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 13, 1925 (Nihoa, Laysan, Lisiansky, Necker, Johnston, Wake islands, Pearl and Hermes Reef).

Kuhlia malo (part) Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 40, 1895 (Hilo; Hawaii).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 19, 1902 (Honolulu).—Bryan and Herre: op. cit., vol. 2, no. 1, p. 129, 1902 (1903) (Marcus Island).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 207, 1903 (1905) (Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 34, 1906, Tubuai; Tahiti; Makatea).

The following in the National Museum were obtained by the Wilkes Expedition: 1 Hawaii to Maui, 24 Hawaiian islands, 1 Oahu, 1 Maui, 6 Hilo, 1 Fiji, 1 Wake Island. Largest 53 mm. In the *Albatross* collections 5 Makemo, 3 Mangareva, 1 Maketea. In the Bishop Musem 5 from Honolulu, 91 Laie Stream on Oahu in November, 1922, from C. Montague Cooke, II and III, 1 Palmyra by Thurston and Thaanum in 1922, 1 Laysan in August, 1905, from Max Schlemner and another in May, 1903, from W. A. Bryan, 13 Marcus Island, 6 Tubuai, 1 Tahiti, 1 Makatea. Also in 1923, 5 Nihoa, 6 French Frigates Shoal, 22 Laysan, 5 Lisiansky, 1 Pearl and Hermes, 1 Johnston Island, 2 Wake Island. Largest 290 mm. In the Agassiz Museum 2 Mangareva, 2 Makemo, 5 Ebon Island, Marshall Islands, from Rev. B. G. Snow in 1877, and 36 Society Islands from Andrew Garrett.

Both *Kuhlia sandvicensis* and *Kuhlia mutabunda* have the median caudal rays less than half the longest. In *Kuhlia sandvicensis* the anal is nearly as long as the head, much longer than caudal peduncle.

Hawaii, Marcus Island, Paumotus, Tahiti, Tubuai.

Kuhlia mutabunda Kendall and Radcliffe.

Kuhlia mutabunda Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 105, pl. 3, fig. 1, 1912 (type loc., Easter Island).—Regan: Zool. Soc. London, Proc., p. 369, pl. 56, 1913 (Easter Island).—Fuentes: Mus. Nacional Chile, Bolet., vol. 7, no. 1, p. 294, pl. 4 (Vaihou and Angaroa, Easter Island).

Head 2 7/8 to 3; depth 2 4/5 to 3; D. XI, I, 11, 1; A. III, 11, 1; tubular scales 48 or 49 in lateral line to caudal base and 5 more on latter; 7 scales above lateral line, 11 or 12 below, 12 to 15 predorsal; snout 3 4/5 to 3 5/6 in head measured from upper jaw tip; eye 2 3/5 to 2 7/8; maxillary 2 1/3 to 2 2/5; interorbital 3 1/4 to 3 4/5.

Body well compressed. Head width 2 1/8 to 2 1/5 in its length. Snout conic, length 2/3 to 3/4 its width. Eye with hind pupil edge midway in head length; diameter much greater than snout or interorbital. Mouth moderate, lower jaw protruding. Maxillary reaches opposite front pupil edge; expansion 3 1/2 in eye. Teeth villiform, fine, in bands in jaws, on vomer and palatines. Front nostril at last 2/5 in snout; hind nostril close behind and above front one. Interorbital broadly and slightly convex. Hind preopercle edge entire, lower edge finely denticulate. Gill rakers 10 + 24, lanceolate, 2 in eye; gill filaments 3/5 of gill rakers. Scales with 8 or 9 basal radiating striae; apical denticles 27 to 33; basal elements 4 or 5; circuli fine. Dorsals and anals with basal scaly sheaths, fins scaleless; caudal finely scaled over greater basal portion; cheek with 4 rows of scales, none on preopercle flange. Lateral line slightly arched, little concurrent with dorsal profile of back and midway along side of caudal peduncle. Fourth dorsal spine 1 2/3 to 2 in head; first dorsal ray 1 9/10 to 2; third anal spine 2 3/4; first anal ray 2 to 2 1/10; caudal 1, well forked with sharp pointed lobes; pectoral 1 1/2 to 1 3/5; ventral 1 3/5 to 1 2/3.

Back slate-gray, sides and below silvery-white. Vertical fins dull olive-gray. Pectoral and ventral pale. Iris silvery-white. Length 68 to 81 mm.

In the Agassiz Museum 34 from Easter Island, obtained by the *Albatross*. Type in the

National Museum, besides 54 specimens from Easter Island.

Distinguished chiefly by its large eye. From *Kuhlia sandvicensis* it differs in having the length of the anal fin shorter than the head or a little longer than caudal peduncle.

Kuhlia taeniura (Cuvier).

Dules taeniurus Cuvier: Hist. nat. Poiss., vol. 3, p. 85, 1829 (type loc., Java).—Kner: Reise "Novara," Fische, vol. 1, pt. 5, p. 47, 1865 (Tahiti).

Kuhlia taeniura Smith and Swain: U. S. Nat. Mus., Proc., vol. 5, p. 128, 1882 (Johnston Island).—Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 39, 1895 (Tahiti).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 372, 1897 (Rotuma).—Waite: Australian Mus., Records, vol. 5, p. 3, 1903 (Paanopa, Ocean Island, Gilberts).—Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 129, 1903 (Marcus Island).—Jordan and Evermann: (U. S.) Bur. Fish., Bull., vol. 23, no. 1, p. 208, 1903 (1905) (Samoa).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 34, 1906 (Faté, New Hebrides).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1377, 1906 (Savaii).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 255, 1905 (1906) (Tutuila).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 283, 1911 (Arhno Atoll, Marshalls).—Fowler and Bean: U. S. Nat. Mus., Proc., vol. 71, p. 14, 1927 (Tahiti).

Dules argenteus Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 25, pl. 19, fig. c, 1874 (Tahiti; Kingsmills).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 12, 1877 (Bonham Islands).

Readily known by the five blackish bands on caudal, one median and 2 on each lobe.

In the Bishop Museum 4 from Marcus Island and 3 Faté. Largest 203 mm. In the National Museum 3 Apia, 2 Johnston Island and 15 Marshall Islands. In the Agassiz Museum 1 Marshall Islands and 4 Apiang, Gilbert Islands, from Andrew Garrett.

Widely distributed throughout the Indo-Pacific, from East Africa to the Revillagigedo Islands.

SERRANIDAE
LATINAE

Lates calcarifer (Bloch).

Holocentrus calcarifer Bloch: Nat. auslandischen Fische, pt. 4, p. 100, pl. 244, 1790 (type loc., Japan).

Lates calcarifer Weber: Nova Guinea, vol. 9, pt. 4, p. 574, 1913 (Bivak Island, Lorentz River).

Pseudolates cavifrons Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 262, pl. 3, 1876 (type loc., Torres Straits or New Guinea).—Macleay: op. cit., vol. 7, p. 225, 1882 (New Guinea).

Head 3 to 4; depth very variable, 2 3/4 to 4; D. VII or VIII, I, 10 to 12; A. III, 8 or 9; scales 50 to 60, 6 or 7 above, 13 to 16 below, pores 50 to 60; eye equals or little shorter than snout to 1/8 or less with age; maxillary extends well beyond eye. Gill rakers 16 or 17 below. Gray or olive above, silvery below. Dorsal, anal and caudal more or less blackish in young. Reaches 1700 mm. (Boulenger)

Shores and river mouths from India to the East Indies, China and Queensland.

Psammoperca waigiensis (Cuvier).

Labrax waigiensis Cuvier: Hist. nat. Poiss., vol. 2, p. 61, 1828 (type loc., Waigiu).—Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 237, 1830 (Offack Bay, Waigiu).

Psammoperca waigiensis Bleeker: Atlas ichth., vol. 7, p. 108, pl. (28) 306, fig. 2, 1873-76 (Waigiu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 253, 1883 (Gulf of Papua).

Head 3 to 3 1/3; depth 3 to 3 1/3; D. VII, I, 12 or 13; A. III, 9; scales 45 to 50, 6 or 7 above, 12 below, pores 45 to 50; eye equals or little shorter than snout, 3 to 4 in head; maxillary reaches below eye center; interorbital less than eye. Gill rakers 11 to 13 below. Olive-brown above, yellowish below, without any spots. Length 320 mm. (Boulenger)

India, East Indies, China.

SERRANINAE

Several unidentifiable serranids have been described imperfectly by Jouan from New Caledonia. They are here mentioned in his sequence.

Serranus No. 56, from Baie du Sud (Soc. Cherbourg, Mem., vol. 8, p. 277, 1861): D. X, 11; A. III, 9. Scales rough. Caudal forked. Gray, greenish and brownish on back. Black spot at end of each caudal lobe. Length 150 mm.

Serranus No. 58 is from the same locality (op. cit., p. 279); D. IX, 16; A. III, 8. Blackish brown, fins blackish. Length 170 mm.

Serranus No. 59 is from Lifu, Loyalty Islands (op cit., p. 279): D. XI, 16; A. III, 8. Scales rough. Deep red, with somewhat paler vertical bands.

Serranus No. 61 is from Kanala (op. cit., p. 281): D. XII, 10; A. III, 8. Body gibbous. Caudal very forked. Gray, with well marked longitudinal lines. Length 160 mm.

Acanthistius fuscus Regan.

Acanthistius fuscus Regan: Zool. Soc. London, Proc., p. 368, pl. 55, 1913 (type loc., Easter Island).—Fuentes: Mus. Nacional Chile, Bolet., vol. 7, no. 1, p. 295, pl. 3, 1914 (Vaihou, Easter Island).

Acanthistius cinctus (non Günther) Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 107, 1912 (Easter Island).

Head 2 3/5; depth 2 3/4; D. XIII, 15; A. III, 8; scales 105, pores 55, 17 above; snout equals eye, which 5 1/3 in head; interorbital 7. Lower jaw little projecting. Maxillary extends to below middle of eye, expansion nearly 3/4 of eye. Gill rakers 9 or 10 on lower branch of first arch. Scales strongly ciliated. Second anal spine longest and strongest, 3 in head. Paired fins subequal, little over half of head. Caudal rounded. Dark brownish. Length 230 mm. (Regan)

One, obtained at Easter Island, December 20, 1904, in the National Museum.

Trachypoma macracanthus Günther.

Trachypoma macracanthus Günther: Cat. fishes Brit. Mus., vol. 1, p. 167, 1859 (type loc., Norfolk Island).

Trachypoma macracanthum Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 107, 1912 (Cook Bay, Easter Island).

Head 2 1/2; depth 2 2/3 to 2 3/4; D. XII, 13 or 14; A. III, 6; scales 90 to 97, 11 or 12 above, 35 below, pores 48 to 50; snout 2/3 of eye, which 3 to 3 1/2 in head and nearly twice interorbital; maxillary to below eye center. Gill rakers 14 or 15 below. Brownish olive,

covered all over with round whitish black-edged specks. Length 180 mm. (Boulenger)

Norfolk Island, Easter Island.

Centrogenys vaigiensis (Quoy and Gaimard).

Scorpaena vaigiensis Quoy and Gaimard: Voyage "Uranie," Zool., p. 324, pl. 58, fig. 1, Dec. 18, 1824 (type loc., Waigiu).

Myriodon waigiensis Schmeltz: Mus. Godeffroy, Cat. 4, p. 13, 1869 (South Sea).—Bleeker: Atlas ichth., vol. 7, pl. (19) 297, fig. 1, 1873-76.—Günther: Rept. voyage "Challenger," vol. 1, p. 38, 1880 (off New Guinea S. Lat. 1° 45′, W. Long. 30° 58′).

Centrogenys waigiensis Bleeker: Atlas ichth., vol. 7, p. 68, 1873-76 (Waigiu).

Centrogenys (Myriodon) waigiensis Peters: Akad. Wiss. Berlin, Monatsb., p. 831, 1876 (1877) (New Guinea).

Centropristes scorpenoides Cuvier: Hist. nat. Poiss., vol. 3, p. 36, 1829 (type loc., Waigiu; New Guinea).

Head 2 1/2 to 2 3/4; depth 2 2/3 to 3; D. XIII or XIV, 9 to 11; A. III, 5; scales 42 to 45, above 4 or 5, below 14 to 16, pores 40 to 42; snout 1/2 to 3/5 of eye, which 3 in head, nearly twice interorbital; maxillary to center or hind third of eye. Gill rakers short, 7 below with some rudiments. Pale brown or reddish, marbled darker. Fins spotted and striped with dark brown and black. Length 110 mm. (Boulenger)

This fish bears a great resemblance to some scorpaenoids with which it has been wrongly associated lately as *Gennadius* Jordan and Seale and *Rhabdosebastes* Fowler and Bean.

Nicobars, East Indies, Queensland.

Stereolepoides thompsoni Fowler (Pl. XIV, *A*).

Stereolepoides thompsoni Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 382, 1923 (type loc., Honolulu).

Only known from the type, a head 584 mm. long in the Bishop Museum. It is allied, though greatly different from *Stereolepis* Ayres.

Pikea japonica Steindachner and Döderlein.

Pikea (Labracopsis) japonica (Döderlein) Steindachner and Döderlein: Akad. Wiss. Wien, Denk., vol. 47, p. 235, pl. 6, fig. 3, 1883 (type loc., Tokyo).

Pikea aurora Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 178, 1902 (1903) (type loc., Hilo; Honolulu).—Jenkins: op. cit., p. 449, 1902 (1903) (Honolulu).—Snyder: op. cit., p. 527, 1902 (1904) (Honolulu).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 942, 1904 (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 220, pl. 14, 1903 (1905) (Honolulu; Hilo).

Head 2 3/5; depth 3; D. VIII, 13, 1 or 14, 1; A. III, 9, 1 or 10, 1; scales 51 in lateral line to caudal base and 10 more on latter; 7 scales above lateral line, 21 below; 42 predorsal scales; snout 4 in head measured from upper jaw tip; eye 5; maxillary 2 1/6; interorbital 5 1/2. Least depth of caudal peduncle 2 1/8 in total head length. Head width 2 2/5 in total head length. Gill rakers III, 3 + 8, V, lanceolate, equal gill filaments or 2 4/5 in eye. Third dorsal spine 3 4/5 in head; eighth dorsal spine 5; seventh dorsal ray 2 1/8; third anal spine 3 7/8; caudal length 1 3/5; pectoral 1 2/5; ventral 2.

Four from Honolulu in the Bishop Museum, 140 to 178 mm. In the National Museum the type of *Pikea aurora* from Hilo, and a specimen from Honolulu. I obtained a specimen in the Honolulu market December 19, 1922.

All my specimens have the preopercle edge minutely denticulate, though scarcely evident without a lens. The last dorsal spine is 2 1/4 to 2 3/4 in length of longest dorsal ray and equals or a little shorter than fourth dorsal spine. The distinctions for the separation of *Pikea aurora* Jordan and Evermann from the Japanese *Pikea japonica* have yet to be shown. I am not able to find anything in the various accounts and figures which would lead to its recognition specifically. Possibly *Pikea lunulata* (Guichenot) from the Indian Ocean may also not be distinct.

Chorististium susumi Jordan and Seale.

Chorististium susumi Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 256, fig. 48, 1905 (1906) (type loc., Apia, Samoa).

Head 2 3/5; depth 3 1/3; D. VI-I, 10; A. III, 8; scales 49, 3 above, 11 below; eye 4 1/2 in head, equals interorbital; maxillary 2 2/5; mandible protrudes; bands of villiform teeth in jaws, on vomer and palatines. Gill rakers 13 below. Dark brown, suffused with red. Seven olive-red longitudinal bands. Fins uniform cherry red. Length 79 mm. (Jordan and Seale)

Paracanthistius maculatus (Bloch).

Bodianus maculatus Bloch: Nat. auslandischen Fische, pt. 4, p. 48, pl. 228, 1790 (type loc., Japan).

Plectropoma maculatum Schmeltz: Mus. Godeffroy, Cat. 4, p. 12, 1869 (Kandavu).—Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 10, pl. 10, 1873 (Paumotus).—Günther: Rept. voyage "Challenger," vol. 1, p. 34, 1880 (Levuka, Fiji).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1378, 1906 (Upolu).

Paracanthistius maculatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 35, 1906 (Faté, New Hebrides).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 256, 1905 (1906) (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 284, 1911 (Funafuti, Ellice Islands).

Plectropoma leopardinum Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 230, 1882 (New Guinea).

The Bishop Museum contains a head 202 mm. long from Faté. It shows: snout 2 5/6 in head; eye 9 1/4; maxillary 2; interorbital 4 2/5; nostrils with oblique groove below, posterior 3 times long as anterior; gill rakers VI?, 2+3, X?, longest 1 2/3 in gill filaments, which 1 2/5 in eye. One in the National Museum from Funafuti. One in the Agassiz Museum from Apiang in the Gilbert Islands, obtained by Andrew Garrett. Length 390 mm.

A large handsome fish, reaching 1060 mm., widely distributed throughout the Indo-Pacific, from East Africa to the Tuamotus. The color very variable. Some yellowish-brown or red with pale blue dark edged spots which may be elongate or bar-like, or all may be very numerous. Sometimes brownish or violet-gray, tail behind and lower lip yellowish, and body may have 5 dark brown or black crossbands and blue spots or dark bands may either be present or absent.

Jouan describes this species as *Plectropoma* No. 67 from Baie du Sud, New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 284, 1861): D. VIII,

11; A. II, 7. Olive, below reddish. Body strewn with small blue spots. Length 550 mm.

He also describes another *Plectropoma* No. 66, from Lifu, Loyalty Islands (op. cit., p. 284). It is unidentifiable: D. X, 15; A. III, 15. Vermilion. Length 150 mm.

Paracanthistius oligacanthus (Bleeker).

Plectropoma oligacanthus Bleeker: Nat. Tijds. Ned. Ind., vol. 7, p. 422, 1854 (type loc., Batavia, Java).—Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 162, 1895 (Caroline Islands).

According to Boulenger, differs from *P. maculatus* in the concavely emarginae soft dorsal and anal fins, the anterior rays very long or half of head. Red, head and fins with blue longitudinal lines. Body with small round blue spots and vertical blue lines down flanks. Pectoral bordered yellow. Length 300 mm.

East Indies, Carolines.

Variola louti (Forskål) (Pl. XIV, *B*).

Perca louti Forskål: Descriptiones animalium, pp. 11, 40, 1775 (type loc., Djedda; Lohaja).

Serranus louti Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 2, pl. 1, 1873 (New Hebrides; Society Islands; Paumotus).—Vaillant: Soc. Philom. Paris, Bull., 7th ser., vol. 11, p. 62, 1886-87 (Rangiroa, Paumotus).

Serranus lauti De Vis: Linn. Soc. New South Wales, Proc., vol. 8, p. 457, 1883 (New Ireland).

Variola louti Bleeker: Atlas ichth., vol. 7, p. 24, pl. (70) 348, fig. 3, 1873-76 (Waigiu; New Guinea).—Streets: U. S. Nat. Mus., Bull. 7, p. 92, 1877 (Christmas Island).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 36, 1904 (Faté, New Hebrides).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 257, 1905 (1906) (Apia; Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 22, p. 33, 1925 (Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 13, 1925 (Wake Island).—Fowler: op. cit., Bull. 38, p. 13, 1927 (Christmas Island).

Epinephelus louti Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 173, 1895 (Aneiteum; Samoa; Meduro).

Epinephelus (Variola) lauti Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1377, 1906 (Samoa).

Serranus punctulatus Quoy and Gaimard: Voyage "Astrolabe," Zool., vol. 3, p. 654, pl. 3, fig. 2, 1834 (New Ireland).—Kittlitz: Denkw. Reise Mikronesien, vol. 2, p. 87, 1858 (Senjawins Island).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, pp. 2, 4, 1859 (Doreh, New Guinea).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).

Perca irrorata Lichtenstein: Descriptiones animalium, Forster, p. 222, 1844 (type loc., St. Christian, Waitako).

Variola flavimarginata Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 257, fig. 49, 1905 (1906) (Apia).

Allied with *Cephalopholis* and *Petrometopon* in the presence of but 9 dorsal spines, but differs from both in the presence of 1 or 2 curved canines each side of mandible besides those in front. Handsomely colored scarlet or carmine, with round, small, lilac, blue-white or red spots everywhere. Vertical fins and pectoral edged yellow.

The Bishop Museum contains 1 Faté, 375 mm. long; 1 Fanning Islands from Edmondson and Ball in May, 1922, 463 mm. long; 1 Palmyra from John W. Thompson November 20, 1917, 553 mm. One from Wake Island in 1923. In the National Museum 1 Christmas Island from T. H. Streets and 3 Apia, Samoa. In the Agassiz Museum 3 from the Society Islands obtained by Andrew Garrett. Also 3 from Apiang, Gilbert Islands, from Andrew Garrett. Largest 393 mm.

Red Sea, Zanzibar and Mauritius to the East Indies and Paumotus.

Petrometopon pachycentron (Valenciennes).

Serranus pachycentron Valenciennes: Hist. nat. Poiss., vol. 2, p. 219, 1828 (type loc., East Indies).

Epinephelus pachycentrum Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 178, 1895 (Louisiade Archipelago).

Epinephelus pachycentrus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 36, 1906 (Shortland Island, Solomons).

Perca punctata Lichtenstein: Descriptiones animalium, Forster, p. 155, 1844 (tropical Pacific Ocean).

Serranus microprion Bleeker: Soc. Sci. Ind. Neerl. Act. no. 2, vol. 6, pp. 2, 3, 4, 1859 (Doreh, New Guinea).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).

Epinephelus microprion Bleeker: Atlas ichth., vol. 7, p. 38, pl. (2) 280, fig. 1, 1873-76 (New Guinea).

Head 2 1/4 to 2 1/3; depth 2 3/5 to 2 2/3; D. IX, 15, 1; A. III, 8, 1; scales 86 in lateral line to caudal base and 10 more on latter; tubes 46 in lateral line to caudal base and 4 more on latter; 18 scales above lateral line to spinous dorsal origin, 28 below; 50? predorsal scales; snout 4 to 4 1/5 in head measured from upper jaw tip; eye 4 1/5 to 5 1/2; maxillary 2; interorbital 6 1/4 to 7. Least depth of caudal peduncle 3 1/4 in total head length. Head width 2 1/4 in its length. Fifth dorsal spine 3 1/10 in head; second anal spine 2 7/8; caudal 1 5/6; pectoral 1 2/5; ventral 2. Dark brown, marked with round dark close-set spots on head, not extending below. Fins dusky and like rest of body unspotted, soft dorsal and anal narrowly edged whitish. Young dark brown generally. Trunk with very fine slightly darker longitudinal lines, one to each row of scales. Pectoral pale yellow basally.

In the Bishop Museum 2 from Shortland Island, 130 to 138 mm. Also 1 from Palmyra Island obtained by Thurston and Thaanum in 1922, 35 mm. long.

India, East Indies, Louisiades, Solomons. Reaches 215 mm.

Cephalopholis boenack (Bloch).

Bodianus boenak Bloch: Nat. auslandischen Fische, vol. 4, p. 43, 1790 (type loc., Japan).

Bodianus boenack Bloch: Nat. auslandischen Fische, vol. 4, pl. 226, 1790.

Serranus boenack Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 225, 1882 (Port Moresby, New Guinea).

Serranus boelang Valenciennes: Hist. nat. Poiss., vol. 6, p. 387, 1830 (New Guinea).

Epinephelus boelang Bleeker: Atlas ichth., vol. 7, p. 40, pl. (68) 346, fig. 5, 1873-76 (New Guinea).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).

Differs from the preceding in much smaller scales, which 97 to 120 (9 to 11 above, 35 to 40 below) and pores 50 to 63. Both have but 8 anal rays. Reaches 300 mm.

Zanzibar, India, East Indies, China.

Cephalopholis sonnerati (Valenciennes).

Serranus sonnerati Valenciennes: Hist. nat. Poiss., vol. 2, p. 222, 1828 (type loc., Pondicherry and Ceylon).—Günther: Cat. fishes Brit. Mus., vol. 1, p. 122,

1859 (Louisiades).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1377, 1906 (Samoa).

Epinephelus sonnerati Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 187, 1895 (Pelew Islands, Kingsmills, Samoa).

Cephalopholis sonnerati Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 14, 1925 (Wake Island).—Fowler: op. cit., Bull. 38, p. 13, 1927 (Fanning Island).

Head 2 1/3; depth 2 1/2; D. IX, 15, 1; A. III, 9, 1; scales 88 in lateral line to caudal base and 20 more out over caudal basally; tubes 47 in lateral line to caudal base and 3 more on latter; 14 scales above lateral line to spinous dorsal, 30 below; about 60 predorsal scales; snout 3 3/4 in head from snout tip; eye 5 1/2; maxillary 2; interorbital 7 1/3.

Body elongately ovoid, well compressed, deepest at spinous dorsal origin. Caudal peduncle well compressed, length 3/4 its least depth, which 3 1/4 in total head length. Head width 1 7/8 in its length. Snout conic, length 5/6 its width. Eye with front pupil edge at first third in head; diameter 1 1/2 in snout, greater than interorbital. Mouth large, lower jaw well protruded. Maxillary reaches slightly beyond hind eye edge; expansion 1 1/6 in eye. Teeth in villiform bands in jaws; outer upper row little enlarged, firmly erect, equidistant and inner in 3 to 5 irregular rows with innermost anteriorly elongated, several quite long and depressible; mandibular in 3 or 4 rows, inner series longest and depressible; pair of small, wide set canines at front of each jaw, upper further apart than lower. Narrow band of fine teeth on vomer and palatines, tongue toothless. Front nostril at last fourth in snout, in short tube; hind nostril simple pore little nearer front nostril than eye. Interorbital convex. Preopercle edge minutely serrated. Median opercular spine little closer to lower than to upper and lowest spine most advanced. Gill rakers VI, 3 + 11, VI, lanceolate, 2 1/3 in eye; gill filaments slightly less than gill rakers.

Scales with 6 to 9 basal radiating striae; apical denticles 28 to 34, with 4 transverse rows of basal elements; circuli fine. Head scaly except lips and upper half of maxillary with minute scales. Chest, breast, predorsal and bases of vertical fins finely scaled. Lateral line well arched above pectoral, drops nearly midway along side of caudal peduncle; tubes small, simple, little exposed. Third dorsal spine 3 2/5 in total head length, thirteenth ray 2 3/4; second anal spine 2 4/5; sixth ray 2 1/4; caudal 1 7/8, rounded convexly behind; pectoral 1 2/5; ventral 2 1/10.

Back and upper surface raw umber, becoming pale isabella color on breast, belly and under surface. Fins little paler than back, darker basally on rayed portions. Head laterally, except occiput, maxillary, lips and mandible, with irregular close-set small brown spots, bars and blotches. Behind mandibular symphysis round deep brown blotch, but little smaller than pupil. Pectoral base deep brown, paired fins otherwise pale. Length 160 mm.

One in the Bishop Museum obtained by the Tanager Expedition at Wake Island, July, 1923. Agrees with Day's figure in many ways, except the head shows fine dark spots and not reticulations. One in the Agassiz Museum from Apiang, Gilbert Islands, obtained by Andrew Garrett, 250 mm. long.

Zanzibar, Mauritius, Seychelles, India, Australia, Melanesia, Micronesia, Polynesia.

Cephalopholis argus Schneider (Pl. XIV, *C*).

Cephalopholis argus Schneider: Systema ichth., Bloch., p. 311, pl. 61, 1801 (type loc., East Indies).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 221, fig. 88, 1903 (1905) (Samoa).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 34, 1906 (Tahiti; Tubuai; Rarotonga; Mangareva; Nukuhiva; Shortland Island).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 258, 1905 (1906) (Pago Pago).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 255, 1907 (Thornton Island; Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 284, 1911 (Jaluit, Marshalls; Taritari, Gilberts; Rangiroa, Paumotus; Funafuti, Ellice Islands).—Fowler: B. P. Bishop Mus., Bull. 22, p. 33, 1925 (Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 14, 1925 (Wake Island).—Fowler: op. cit., Bull. 38, p. 13, 1927 (Palmyra, Jarvis, and Tongareva islands).

Serranus guttatus var. *argus* Günther: Mus. Godeffroy, Jour., vol. 1, no. 1, p. 5, pl. 4, figs. A-B, 1873.

Epinephelus argus Bleeker: Atlas ichth., vol. 7, p. 43, pl. (42) 320, fig. 3, 1873-76 (New Guinea).—Streets: U. S. Nat. Mus., Bull. 7, p. 91, 1877 (Christmas Island).—Macleay: Linn. Soc. New South Wales, Proc., p. 254, 1883 (China Straits, New Guinea).—Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 189, 1895 (Duke of York Island, Savay, Samoa).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, p. 377, 1906 (Upolu).

Bodianus gutatus (preoccupied by *Perca guttata* Linné) Bloch: Nat. auslandischen Fische, vol. 4, p. 36, 1790 (type loc., East or West Indies, Africa, St. Helena Island, Jamaica).

Bodianus guttatus Bloch: Nat. auslandischen Fische, vol. 4, pl. 224, 1790.—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 485, 1899 (Thornton Island).

Serranus guttatus Valenciennes: Hist. nat. Poiss., vol. 2, p. 267, 1828 (Waigiu).—Kner: Reise "Novara," Fische, vol. 1, pt. 5, p. 22, 1865 (Tahiti).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 12, 1869 (Upolu).—Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 5, pl. 4, 1873 (Polynesia).—Peters: Akad. Wiss. Berlin, Monatsb., p. 831, 1876 (1877) (New Britain).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 226, 1882 (New Guinea).

Perca guttata Lichenstein: Descriptiones animalium, Forster, p. 155, 1844 (tropical Pacific Ocean).

Serranus myriaster Valenciennes: Hist. nat. Poiss., vol. 2, p. 273, 1828 (type loc. Borabora and Hawaiian islands).—Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 234, pl. 37, 1830 (Borabora).—Quoy and Gaimard: Voyage "Astrolabe," Zool., vol. 3, p. 653, pl. 3, fig. 1, 1834 (New Guinea).

Serranus immunerur Thiollière: Fauna Woodlark, p. 144, 1857 (type loc., Woodlark Island).

Serranus perguttatus De Vis: Linn. Soc. New South Wales, Proc., vol. 8, p. 445, 1883 (type loc., New Hebrides).

Among the species with rounded caudal and 9 soft anal rays, the scales 95 to 110, 9 to 10 above and 32 to 38 below, pores 50 to 55, and pectoral 3/5 to 2/3 of head. Body dark anteriorly, paler behind, with dark vertical bands. Small black bordered blue spots on head and body. Soft fins with light edge and spinous dorsal edge yellow.

In the Bishop Museum 1 Mangareva, 2 Shortland Island, 1 Tubuai, 5 Tahiti, 2 Nukuhiva, 1 Rarotonga and at Palmyra, 3 from Thurston and Thaanum in 1922, 1 from Thurston in November, 1917, and 1 from C. Montague Cooke, Jr. Largest 377 mm. One from Wake Island by the Tanager Expedition. In the National Museum the Wilkes Expedition obtained 1 at the Tuamotus, 349 mm. Others were 2 from Tahiti by W. H. Jones in 1883, 10 Fanning Islands from T. H. Streets, 3 Jaluit, 1 Funafuti, 1 Taritari, 1 Rangiroa and 4 Apia. Eleven in the Agassiz Museum

from Apiang, Gilbert Islands, and 8 from the Society Islands, obtained by Andrew Garrett. Two from Ascension Island in the Marshall Islands through Rev. A. A. Strong. Also 1 from Apia, Samoa, 1 from Ebon Island in the Marshall Islands, and 1 from Ponapé in the Carolines. Largest 315 mm. In the Academy 1 from Apia, 3 from Thornton Island.

Zanzibar, Mauritius, Seychelles, India, East Indies to Paumotus. Reaches 430 mm.

Cephalopholis miniatus (Forskål).

Perca miniata Forskål: Descriptiones animalium, pp. 11, 41, 1775 (type loc., Djedda and Lohaja, Red Sea).

Serranus miniatus Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 5, pl. 5, 1873 (Samoa).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 22, 1874 (Savaii).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 226, 1882 (New Guinea).

Epinephelus miniatus Bleeker: Atlas ichth., vol. 7, p. 41, pl. (5) 283, fig. 3, 1873-76 (New Guinea and Waigiu).—Peters: Akad. Wiss. Berlin, Monatsb., p. 831, 1876 (1877) (New Britain).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).—Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 191, 1895 (Apamana and Samoa).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1377, 1906 (Samoa).

Cephalopholis miniatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 35, 1906 (Shortland Island, Solomons).—Fowler: B. P. Bishop Mus., Bull. 38, p. 13, 1927 (Fanning Island).

Perca maculata (Forster) Lichtenstein: Descriptiones animalium, p. 220, 1844 (type loc., St. Christian Island, Waitako).

Cephalopholis boninius Jordan and Thompson: Carnegie Mus., Mem., vol. 6, no. 4, p. 248, pl. 29, fig. 7, 1914 (type loc., Bonin Islands).

Head 2 3/5; depth 2 7/8; D. IX, 16, 1; A. III, 9, 1; scales 81 in lateral line to caudal base and 9 more on latter; 51 tubes in lateral line and 5 more on latter; 17 scales above, 30 below; 53? predorsal scales; snout 4 in head measured from upper jaw tip; eye 7; maxillary 2; interorbital 6 1/2. Head width 2 1/4 in total head length; third dorsal spine 3 1/4; second anal ray 3 1/5; caudal 1 2/3; least depth of caudal peduncle 3; pectoral 1 3/5; ventral 1 7/8.

In the Bishop Museum 2 from Shortland Island, 187 and 298 mm. long. In color red or pinkish, with large blue spots with dark borders, which few or absent on paired fins. Reaches 410 mm. In the Agassiz Museum 3 from Ebon Island, largest 310 mm.

Zanzibar, Mauritius, India, East Indies to Samoa.

Cephalopholis urodelus (Schneider).

Percam urodetam (Forster) Schneider: Systema ichth., Bloch, p. 333, 1801 (type loc., St. Christina, Waiaho).

Perca urodeta (Forster) Lichtenstein: Descriptiones animalium, p. 221, 1844 (St. Christina).

Serranus urodelus Valenciennes: Hist. nat. Poiss., vol. 2, p. 227, 1828 (type loc., Tahiti).—Valenciennes: op. cit., vol. 6, p. 386, 1830 (Ulea).—Kittlitz: Denkw. Reise Mikronesien, vol. 2, p. 87, 1858 (Senjawins Island).—Bleeker: Soc. Sci. Ind. Neerl., Act. no. 2, vol. 6, pp. 2, 4, 1859 (Doreh, New Guinea).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 12, 1869 (Samoa).—Günther: Cruise of "Curacoa," Brenchley, p. 409, 1873 (Solomon Islands).—Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 3, pl. 3, fig. A, 1873 (Society Islands; Kingsmills; Hervey Islands; Paumotus; Solomons).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 226, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 254, 1883 (China Straits, New Guinea).

Epinephelus urodelus Bleeker: Atlas ichth., vol. 7, p. 41, pl. (43) 321, fig. 2, 1873-76 (New Guinea).—Streets: U. S. Nat. Mus., Bull. 7, p. 91, 1877 (Fanning Islands).—Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 192, 1895 (Solomon Islands; Aneiteum, New Hebrides; Micronesia).—Waite: Australian Mus., Mem., no. 3, p. 181, 1897 (Funafuti, Ellice Islands).

Cephalopholis urodelus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 34, 1906 (Mangareva).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 258, 1905 (1906) (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 284, 1911 (Jaluit, Marshalls).

Squamation, pectorals, depth of body as in the preceding species, but ventrals not reaching the vent and pale pectoral with or without blue spots. Length 240 mm.

The Agassiz Museum has 10 from the Society Islands and 7 from the Gilbert Islands, all through Andrew Garrett. Also 3 from Ebon Island in the Marshall Islands. Largest 205 mm. In the Bishop Museum 1 from Nukuhiva, 2 Mangareva and 1 Palmyra from Thurston and Thaanum in 1922. The Wilkes Expedition obtained 1 at the Tuamotus, now in the National Museum. Other specimens 2 from Tahiti obtained by William Stimpson, 2 from Fanning Islands by T. H. Streets, 2 Apia, 1 Jaluit and 1 Tempe, Marquesas, from W. H. Jones, June 23, 1883. Largest 234 mm.

Zanzibar, Mauritius, Seychelles, East Indies to the Tuamotus.

Cephalopholis aurantius (Valenciennes).

Serranus aurantius Valenciennes: Hist. nat. Poiss., vol. 2, p. 226, 1828 (type loc., Seychelles).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).

Epinephelus aurantius Bleeker: Atlas ichth., vol. 7, p. 37, pl. (20) 298, fig. 3, 1873-76 (New Guinea).—Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 193, 1895 (Louisiades).

Serranus roseus Valenciennes: Hist. nat. Poiss., vol. 2, p. 228, 1828 (type loc., Tahiti).

Serranus analis Valenciennes: Hist. nat. Poiss., vol. 2, p. 228, 1828 (type loc., New Ireland).—Lesson: Voyage "Coquille," Zool., pt. 2, vol. 1, p. 235, 1830 (type loc., New Ireland).

Like *C. urodelus* and *C. miniatus*, but the color bright orange or pink, with or without blue dots on head and front of back. Reaches 300 mm.

East Indies to Tahiti.

Cephalopholis sexmaculatus (Rüppell).

Serranus sexmaculatus Rüppell: Atlas Reis. Nord. Afrika, Fische, p. 107, 1828 (type loc., Red Sea).—Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 3, pl. 2, 1873 (Society Islands; Paumotus).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 11, 1877 (Pelew Islands).

Epinephelus sexmaculatus Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 194, 1895 (Tahiti).

Head 2 2/3 to 3; depth 2 1/2 to 2 2/3; D. IX, 15; A. III, 9; scales 100 to 105, 7 to 9 above, 35 to 43 below, pores 50 to 55; snout longer than eye, which 5 1/2 to 6 in head; maxillary extends beyond eye; teeth in 3 or

4 series on side of mandible; interorbital 6 to 6 1/2 in head. Gill rakers 15 below. Red, dotted nearly all over with blue. Sometimes blue lines also present on head. On back 4 large black spots at dorsal base and 2 behind dorsal. Length 375 mm. (Boulenger)

In the Agassiz Museum 3 from the Society Islands, obtained by Andrew Garrett, 179 to 290 mm. long.

Red Sea, Zanzibar, Mauritius, Tahiti.

Cephalopholis leopardus (Lacépède).

Labrus leopardus Lacépède: Hist. nat. Poiss., vol. 3, pp. 450, 518, pl. 30, fig. 1, 1802 (type loc., Great Equatorial Ocean).

Serranus leopardus Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 4, pl. 3, fig. 3, 1873 (Society Islands).

Epinephelus leopardus Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 195, 1895 (Louisiades; Tahiti).—Waite: Australian Mus., Mem., no. 3, p. 181, 1897 (Funafuti, Ellice Islands).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1377, 1906 (Samoa).

Cephalopholis leopardus Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 285, 1911 (Arhno and Jaluit, Marshalls).

Head 2 2/3 to 2 3/4; depth 2 1/2 to 2 3/4; D. IX, 14; A. III, 9; scales 80 to 90, 5 to 7 above, 28 to 30 below, pores 46 to 53; snout little longer than eye, which 4 to 5 1/2 in head; maxillary reaches beyond eye; 3 to 5 rows of lateral mandibular teeth; interorbital 5 1/2 to 6 in head. Gill rakers 16 below. Yellowish or olive, spotted with red. More or less distinct dark stripe on temple. Caudal peduncle above with 1 or 2 black spots. Caudal with 2 oblique dark bars, converging behind or united into crescentic band. Length 195 mm. (Boulenger)

In the National Museum 1 from Arhno and 1 from Apia. One in the Agassiz Museum from the Society Islands, 192 mm. long, obtained by Andrew Garrett.

Mauritius, East Indies, Samoa, Society Islands.

Serranus fasciatus (Forskål).

Perca fasciata Forskål: Descriptiones animalium, pp. 11, 40, 1775 (type loc., Red Sea at Cape Mohammed).

Serranus fasciatus Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 6, pl. 6, 1873 (Society Islands; Paumotus).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 228, 1882 (New Guinea).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 14, 1925 (Wake Island).—Fowler: op. cit., Bull. 38, p. 13, 1927 (Jarvis Island).

Epinephelus fasciatus Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 238, 1895 (Louisiades; Bonham Island; Tahiti?).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 36, 1906 (Mangareva).

Serranus variolosus Valenciennes: Hist. nat. Poiss., vol. 2, p. 265, 1828 (type loc., Tahiti).

Perca maculata (Forster) Valenciennes: Hist. nat. Poiss., vol. 2, p. 265, 1828 (name in text).

?Serranus marginatus Schmeltz: Mus. Godeffroy, Cat. 6, p. 11, 1877 (Yap).

Serranus marginalis Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 9, 1885 (Rubi, New Guinea).

Epinephelus zapyrus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 36, fig. 11, 1906 (type loc., Tubuai, Cook Islands).

Head 2 2/5; depth 3; D. XI, 16, 1; A. III, 8, 1; scales 116 in lateral line to caudal base and 10 more on latter; tubes 88? in lateral line to caudal base and 6? more on latter; 16 scales above lateral line, 25 below; 58? predorsal scales; snout 3 3/4 in head from upper jaw tip; eye 6; maxillary 2 2/5; interorbital 7 1/10. Head width 2 1/10 in its total length. Snout broad, little wider than long. Maxillary about to hind eye edge; expansion 1 2/5 in eye. Bands of fine conic teeth in jaws, on vomer and palatines; upper outer row slightly enlarged and firmly erect; lower inner ones largest and depressible; lower teeth in about 4 series, of which 2 inner irregular. Hind preopercle edge minutely serrated. Gill rakers II, 5+9, VI, lanceolate, equal gill filaments or 2 3/4 in eye. Scales all with many minute ones basally; basal radiating striae 4 and 2 or 3 incomplete auxiliaries usually present; apical denticles 35 to 38, rather robust, basal elements in 3 series; circuli moderate. Largely uniform brownish. Spinous dorsal edged dusky. Dusky ring around eye.

In the Bishop Museum 3 from Mangareva, 1 Faté, 2 Nukuhiva, and 1 from Palmyra Island, obtained by Thurston and Thaanum in 1922. One from Wake Island in 1923. Also type of *Epinephelus zapyrus* Seale, noted above, length 324 mm. It is described without sufficient characters to distinguish it from *Serranus fasciatus*, as given by Boulenger. Apparently the distinction would be the "uniform scarlet vermilion color, the fins tipped with orange, the spinous dorsal with a tip of deep crimson." Boulenger gives the color as "red or pale brown with or without markings and membrane between dorsal spine broadly tipped with black." In the Mangareva specimens of *Epinephelus fasciatus* Seale says of the color "in spirits the white dots disappear." Though the Wilkes specimens below have doubtless been in alcohol for 80 years, they still show the dots very distinctly. One obtained at Wake Island by the Tanager Expedition pale brown on back to whitish below. Across back above 6 deeper brown transverse bands of these 3 predorsal. Dorsals yellowish-white, membranes of spinous fin marginally broadly blackish and also blackish basal streak to same fin. Other fins all pale yellowish. Lower hind border of orbit narrowly blackish. The National Museum has 2 from the Tuamotus and 1 from Tahiti obtained by the Wilkes Expedition, 173 to 270 mm. Also 2 obtained by W. H. Jones, June 23, 1883, at Tempe, Marquesas Islands.

Red Sea, Zanzibar, Seychelles, East Indies, China, Japan, Melanesia, Micronesia, Polynesia.

Serranus spiniger Günther.

Serranus spiniger Günther: Cat. fishes Brit. Mus., vol. 1, p. 146, 1859 (no type locality).

Epinephelus spiniger Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 197, pl. 4, fig. B, 1895 (type).—Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 129, 1902 (1903) (Marcus Island).

Head 2 2/3 to 2 3/4; depth 3 1/8 to 3 1/5; D. XI, 16, 1 or 17, 1; A. III, 8, 1; scales 110 to 117 in lateral line to caudal base and 8 to 10 more on latter; tubes 66 to 68 in lateral line and 6 more on latter; 15 to 18 scales above lateral line, 31 to 35 below; predorsal scales 55 to 60; snout 4 1/2 to 4 3/4 in head measured from upper jaw tip; eye 5; maxillary 2 to 2 1/10; interorbital 6 to 6 1/10. Least depth of caudal peduncle 3 1/3 to 3 2/5 in total head length. Gill rakers IV, 2+12, V, lanceolate, slightly less than gill filaments or 2 4/5 in eye. Second dorsal spine 2 1/6 to 2 1/4 in head; second anal spine 3 to 3 1/3; caudal 1 2/3 to

1 5/6; pectoral 1 3/5 to 1 3/4; ventral 1 9/10. Uniform brown. Spinous dorsal black edged. Soft dorsal, anal and caudal narrowly white edged, submarginally with pale dusky-gray line. Pectoral pale brown, ventral darker. Length 182 to 198 mm.

In the Bishop Museum 1 from Marcus Island and 1 from Nukuhiva, Marquesas Islands, from Alvin Seale in June to August, 1902.

Originally described from unknown locality by Günther. Bryan and Herre next report it from Marcus Island and I now add Seale's specimen from the Marquesas, showing it has a wide distribution.

Serranus flavo-caeruleus (Lacépède).

Holocentrus flavo-caeruleus Lacépède: Hist. nat. Poiss., vol. 4, pp. 331, 367, 1802 (type loc., Mauritius).

Epinephelus flavocaeruleus Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 198, 1895 (Mortlock Islands; Micronesia; Ponapé).

Serranus hoedtii Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 9, pl. 8, fig. A, 1873 (Kingsmills).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 226, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 254, 1883 (China Straits, New Guinea).

Head 2 3/5 to 3; depth 2 1/2 to 2 4/5; D. XI, 15 to 17; A. III, 8; scales 130 to 150, 20 to 25 above, 55 to 65 below, pores 65 to 75; snout equals or little longer than eye, which 4 to 5 in head and nearly equals interorbital; maxillary to center or hind eye edge. Gill rakers 16 to 18 below. Caudal truncate or slightly emarginate. Pale lilac to dark purplish-blue, pectorals and sometimes other fins uniform yellow. Length 460 mm. (Boulenger)

In the Agassiz Museum 1 from the Gilbert Islands, obtained by Andrew Garrett, 137 mm. long. Also 1 from Ebon Island, 410 mm.

Zanzibar, Mauritius, India, East Indies, China, Micronesia.

Serranus undulosus (Quoy and Gaimard).

Bodianus undulosus Quoy and Gaimard: Voyage "Uranie," Zool., p. 310, 1824 (type loc., Waigiu and Rawak).

Epinephelus undulosus Bleeker: Atlas ichth., vol. 7, p. 46, pl. (10) 288, fig. 3, 1873-76 (Waigiu).—Bleeker: Akad. Amsterdam, Vehr., vol. 14, pt. 2, p. 65, 1874 (Waigiu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 35, 1906 (Shortland Island).

Head 2 1/2; depth 2 3/4; D. XI, 18, 1; A. III, 8, 1; scales 112 in lateral line to caudal base and 15 more on latter; tubes 65 in lateral line to caudal base and 5 more on latter; 23 scales above lateral line, 36 below; 80 predorsal scales; snout 4 in head measured from upper jaw tip; eye 5 1/10; maxillary 2 1/8; interorbital 5 1/4. Least depth of caudal peduncle 3 3/4 in total head length. Head width 2 in its length. Snout slightly longer than broad. Teeth in narrow bands in jaws, lower biserial laterally; pair of canines in front of each jaw; small teeth on vomer and palatines. Maxillary reaches hind eye edge; expansion 1 1/3 in eye. Hind preopercle edge serrate and 6 small denticles at angle. Gill rakers 13+20, lanceolate, 1/3 longer than gill filaments or 1 3/4 in eye. Scales with 3 to 5 basal radiating striae; apical denticles 30 to 38, basal elements in 7 to 11 series; circuli fine. Third dorsal spine 2 7/8 in head; eighth dorsal ray 2 3/4; third anal spine 4; fourth anal ray 2 1/4; caudal slightly emarginate, 1 2/5; pectoral 1 5/6; ventral 1 3/4. Largely purplish-brown, paler below. About 12 longitudinal narrow darker lines on head and trunk. Edge of spinous dorsal membrane dusky. Pectoral pale yellowish. Ventral dusky terminally. Iris pale slaty.

One in the Bishop Museum from Shortland Island, 235 mm. long.

India, East Indies, China, Solomons. Reaches 360 mm.

Serranus diacanthus Valenciennes.

Serranus diacanthus Valenciennes: Hist. nat. Poiss., vol. 2, p. 237, 1828 (type loc., Malabar).—Günther: Rept. voyage "Challenger," vol. 1, p. 38, 1880 (Arafura Sea in S. Lat. 9° 36′ E. Long. 137° 56′).—Fowler: B. P. Bishop Mus., Bull. 38, p. 13, 1927 (Jarvis Island).

Head 2 1/2 to 3; depth 3 to 3 1/2; D. XI, 15 to 17; A. III, 8; scales 105 to 120, 11 to 15 above, 40 to 46 below, pores 52 to 60; snout equals or slightly longer than eye, which 4 1/2 to 5 1/2 in head; maxillary reaches hind eye edge; lateral mandibular teeth biserial; interorbital 6 to 8 in head. Gill rakers 15 or 16 below. Caudal rounded, subtruncate with age. Brown, with or without small darker spots, with 5 or 6 dark vertical bands. Sometimes dark oblique streak on cheek. Fins unspotted, dark at end. Length 520 mm. (Boulenger)

Persian Gulf to India, China, East Indies, Jarvis Island.

Jouan describes it as *Serranus* No. 57 from Port de France, New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 278, 1861): D. XI, 16; A. III, 7. Scales rough. Rose color, with deeper vertical bands. Fins rosy, deep yellow on pectoral, ventrals and soft dorsal. Length 230 mm.

Serranus maculatus (Bloch).

Holocentrus maculatus Bloch: Nat. ausländischen Fische, vol. 4, pt. 7, p. 96, pl. 242, fig. 3, 1790 (type loc., East Indies).

Serranus maculatus Bleeker: Soc. Sci. Ind. Neerl., Act., vol. 6, p. 3, 1859 (Doreh, New Guinea).—Peters: Akad. Wiss. Berlin, Monatsb., p. 831, 1876 (1877) (Bougainville Islands; Solomons; Fiji).

Epinephelus maculatus Bleeker: Atlas ichth., vol. 7, p. 50, pls. (8) 286, fig. 3; (11) 289, fig. 2; (16) 294, fig. 2; (26) 304, fig. 2, 1873-76 (New Guinea).—Bleeker: Kon. Akad. Amsterdam, Verh., vol. 14, pt. 2, p. 75, 1874 (New Guinea).—Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 211, 1895 (Ponapé; Meduro).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 35, 1906 (Shortland Island).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 259, 1905 (1906) Apia).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 11, 1908 (Suva, Fiji).—Fowler: B. P. Bishop Mus., Bull. 22, p. 9, 1925 (Guam).

Serranus quoyanus Valenciennes: Hist. nat. Poiss., vol. 6, p. 390, 1830 (type loc., New Guinea).

Serranus gaimardi Valenciennes: Hist. nat. Poiss., vol. 6, p. 391, 1830 (type loc., New Guinea).—Quoy and Gaimard: Voyage "Astrolabe," Zool., vol. 3, p. 656, pl. 3, fig. 3, 1834 (Vanicoro; New Guinea).

Plectropoma kulas Thiollière: Fauna Woodlark, p. 145, 1857 (type loc., Woodlark Island).

Serranus sebae Bleeker: Soc. Sci. Ind. Neerl., Act., vol. 6, p. 4, 1859 (Doreh, New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 12, 1869 (South Sea).

Sparus venenosus Jouan: Soc. Cherbourg, Mem., vol. 9, p. 185, 1863 (on Jouan, op. cit., p. 115, type loc., New Caledonia).

Serranus madurensis Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 8, pl. 9, fig. A, 1873 (type loc., Meduro, Marshall Islands).

Serranus albofuscus Schmeltz: Mus. Godeffroy, Cat. 6, p. 11, 1877 (Pelew Islands).

Serranus carinatus (non Alleyne and Macleay) Jouan: Soc. Cherbourg, Mem., vol. 21, p. 333, 1877-78 (note).

Head 2 2/5; depth 2 5/6; D. XI, 16, 1; A. III, 8, 1; scales 90 in lateral line to caudal base and 9 more on latter; tubes 53 in lateral line to caudal base and 7 on latter; 13 scales above lateral line, 29 below; 67 predorsal scales; snout 5 in head from upper jaw tip; eye 5; maxillary 2 1/5; interorbital 7 1/4. Least depth of caudal peduncle 3 3/4 in total head length. Head width 2 1/4 in its length. Maxillary extends slightly beyond eye; expansion 1 3/4 in eye. Teeth in narrow bands in jaws, biserial in mandible laterally; 2 small canines in front of each jaw. Hind preopercle edge finely serrate, 5 denticles at angle. Gill rakers VI, 3+11, VI, lanceolate, rather robust, slightly longer than gill filaments or 2 3/5 in eye. Scales with 7 basal radiating striae; apical denticles 18 to 26, basal elements in 8 or 9 series; circuli moderately fine. Third dorsal spine 2 4/5 in total head length; third anal spine 3 1/4; caudal 1 3/4, rounded; pectoral 1 3/5; ventral 2 1/10.

Dull brown generally, everywhere rather scattered dark or dusky round spots, none larger than pupil. Edges of fins narrowly edged whitish, with submarginal dusky shade, especially on paired ones. Blakish blotch at bases of last dorsal spines and on caudal peduncle behind soft dorsal. Iris pale slaty.

In the Bishop Museum 1 from Faté, 193 mm. long. It resembles Bleeker's figure of *Epinephelus albofuscus* (Atlas ichth., vol. 7, pl. [26] 304, fig. 2, 1875-76), except he does not show black dorsal and caudal peduncle blotches. One from Guam in 1923. In the National Museum a specimen 190 mm. from Samoa obtained by the Wilkes Expedition. In the same institution 2 others from New Guinea 203 and 216 mm. long. In the Agassiz Museum 2 from Ebon Island in the Marshall Islands, larger 400 mm.

Zanzibar, Mauritius, Ceylon, East Indies, to Fiji and Samoa.

Jouan describes this species from New Caledonia several times, as follows:

Plectropoma No. 63, from Port de France and Baie du Sud (Soc. Cherbourg, Mem., vol. 8, p. 282, 1861): D. XI, 15; A. III, 8. Whitish gray on back and flanks, strewn with irregular yellowish and blackish spots. Length 350 mm.

Plectropoma No. 64, from Port de France (op. cit., p. 283).

Plectropoma No. 65, from reefs of Port de France (op. cit.).

Serranus No. 18, from reefs about Port de France (op. cit., vol. 9, p. 115).

Serranus sexfasciatus Valenciennes.

Serranus sexfasciatus (Kuhl and Van Hasselt) Valenciennes: Hist. nat. Poiss., vol. 2, p. 269, 1828 (type loc., Java).

Epinephelus sexfasciatus Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 214, 1895 (Louisiades).

Serranus diacanthus (part) Günther: Cat. fishes Brit. Mus., vol. 1, p. 110, 1859 (Louisiades).

Head 3; depth 3 to 4; D. XI, 15; A. III, 8; scales 90 to 100, 9 to 12 above, 30 to 35 below, pores 52 to 56; snout equals eye, which 3 1/2 to 4 1/2 in head; maxillary reaches below last third of eye or its hind edge; lateral mandibular teeth biserial; interorbital 6 to 7 in head. Gill rakers 13 or 14. Brown or olive, with yellowish round spots and 5 to 6 blackish vertical bands or pairs of bands. Dorsal and caudal with round black spots. Pectorals yellowish, ventrals blackish at end. Length 230 mm. (Boulenger)

East Indies, Louisiades.

Serranus australis Castelnau.

Serranus australis Castelnau: Intercol. Exhib. Essays Vict. Dep. (Res. Fish. Australia), no. 2, p. 7, 1875 (type loc., Cape York; Darnley Island).

Epinephelus australis Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 215, pl. 6, 1895 (New Britain).

Head 2 4/5; depth 2 4/5; D. XI, 15; A. III, 8; scales 100, 14 above, 42 below, pores 60; snout long as eye, which 5 in head; maxillary reaches to hind fourth of eye; lateral mandibular teeth biserial; interorbital 7 in head. Gill rakers 16 below. Dark purplish brown, with whitish dots, most distinct on body below lateral line. Length 180 mm. (Boulenger)

Serranus dictiophorus Bleeker.

Serranus dictiophorus Bleeker: Soc. Sci. Ind. Neerl., Act., no. 6, vol. 1, p. 38, 1856 (type loc., Manado, Celebes).

Serranus (Epinephelus) dictyophorus Steindachner: Akad. Wiss. Wien, Sitz., vol. 102, pt. 1, p. 219, 1893 (Honolulu).

Head 3; depth 3; D. XI, 17; A. III, 8; scales 100, 11 or 12 above, 45 below, pores 55; snout longer than eye, which 5 1/2 to 6 in head, little exceeds interorbital; maxillary to center or last third of eye; lateral mandibular teeth biserial. Gill rakers 15 below. Head and body closely covered with small orange or reddish-brown spots separated by a grayish network. Traces of 4 or 5 dark crossbands on body, probably well-marked in young. Soft fins orange, with large blackish-brown round spots. Pectoral and soft dorsal edged yellow. Length 350 mm. (Boulenger)

Though Boulenger thinks Steindachner's Honolulu record must pertain to some other species, I feel it best to retain it. Steindachner's determinations I have found most always correct, so I hardly feel he could have been mistaken in this case.

Seychelles, Celebes and Hawaii.

Serranus chlorocephalus Valenciennes.

Serranus chlorocephalus Valenciennes: Hist. nat. Poiss., vol. 6, p. 392, 1839 (type loc., Tongatabu, Friendly Islands).

Epinephelus chlorocephalus Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 217, 1895 (type).

Head 3; depth 3; D. XI, 17; A. III, 8; scales 96, 11 above, 38 below, pores 55; snout equals eye which 4 1/3 in head; maxillary to last fourth of eye; lateral mandibular teeth biserial; interorbital 6 1/2 in head. Gill rakers 15 below. Green, body with 7 or 8 alternate greenish-brown and orange stripes. Dorsal and anal spotted reddish-brown at base. Caudal barred with reddish. Paired fins pale green. Length 210 mm. (Boulenger)

Serranus bontoides Bleeker.

Serranus bontoides Bleeker: Nat. Tijds. Ned. Ind., vol. 8, p. 405, 1855 (type loc., Amboina).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).—Bleeker: Kon. Akad. Amsterdam, Verh., vol. 14, pt. 2, p. 85, 1873 (New Guinea).

Epinephelus bontoides Bleeker: Atlas ichth., vol. 7, p. 53, pl. (9) 287, fig. 2, 1873-76 (New Guinea).

Epinephelus pachycentron Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 111, 1885 (Saonek, Waigiu).

Head 3; depth 3; D. XI, 15 to 17; A. III, 8; scales 85 to 95, 9 to 11 above, 35 to 45 below, pores 53 to 65; snout long as eye, which 4 to 4 1/2 in head; maxillary

to hind eye edge; interorbital 7 to 8 in head. Gill rakers 14 to 16 below. Brown above, with more or less numerous black dots, which may be absent from fins. Length 200 mm. (Boulenger)

One in the Agassiz Museum from Ponapé, Carolines.

East Indies.

Serranus megachir Richardson.

Serranus megachir Richardson: British Assoc. Adv Sci., Rept., p. 230, 1845 (type loc., China).

Epinephelus megachir Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 219, 1895 (Louisiades).

Epinephelus gilberti (non Richardson) Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).—Bleeker: Kon. Akad. Amsterdam, Verh., vol. 14, pt. 2, p. 91, 1874 (Waigiu).

Serranus alatus Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 264, pl. 4, fig. 2, 1876 (type loc., Hall Sound, New Guinea).

Head 2 4/5 to 3; depth 2 4/5 to 3; D. XI, 16 to 18; A. III, 8; scales 85 to 95, 10 to 12 above, 40 to 45 below, pores 48 to 53; snout long as or little shorter than eye, which 4 to 5 in head; maxillary to hind eye edge or beyond; interorbital 6 to 7 in head. Gill rakers 14 or 15 below. Brown, with large, darker, unequal spots, separated by pale polygonal network. Dorsal, anal and caudal with large round dark brown spots. Pectorals brown or blackish, uniform or spotted. Length 350 mm. (Boulenger)

India, East Indies, China, Louisiades.

Serranus gilberti Richardson.

Serranus gilberti Richardson: Ann. Mag. Nat. Hist. London, vol. 9, p. 19, 1842 (type loc., near entrance to harbor of Port Essington).

Head 3 to 3 1/3; depth 3 1/2 to 3 3/4; D. XI or XII, 16 or 17; A. III, 8; scales 95 to 110, 10 to 12 above, 38 to 40 below, pores 55 to 60; snout equals eye, 5 in head; maxillary extends beyond eye; interorbital 7 to 8 in head. Gill rakers 15 to 17 below. Head and body covered with unequal spots, some black, some brown, separated by pale or whitish polygonal net-work. Dorsal, anal and caudal with large round dark brown or black spots and caudal with fine whitish edge. Pectoral dark at end, with narrow whitish edge. Length 400 mm. (Boulenger)

In the Agassiz Museum 1 from Makemo, 1 Mangareva, 1 Funafuti, 15 Apia, 7 Apiang in the Gilbert Islands through Andrew Garrett, 19 Society Islands through Andrew Garrett, 14 Ascension Island in the Marshall Islands through Rev. A. A. Strong, 5 Ebon Island through Rev. B. G. Snow, 1 Carolines through Andrew Garrett, 1 Kusaie through Rev. B. G. Snow and 5 Ponapé through Rev. L. H. Gulick. Largest 215 mm.

East Africa to Australia and Tuamotus.

Serranus trimaculatus Valenciennes.

Seranus trimaculatus Valenciennes: Hist. nat. Poiss., vol. 2, p. 247, 1828 (type loc., Japan).

Serranus ura Schmeltz: Mus. Godeffroy, Cat. 4, p. 12, 1869 (Kandavu).

Head 2 4/5 to 3; depth 3 to 3 1/5; D. XI, 16 or 17; A. III, 8; scales 100, 11 or 12 above, 40 to 42 below, pores 55 to 57; snout equals eye, which 4 1/2 in head; maxillary to below hind eye edge or slightly beyond; lateral mandibular teeth biserial; interorbital 6 1/2 to 7 in head. Gill rakers 15 below. Pale brown, with small round darker spots. Large blackish blotch on back at bases of 3 or 4 last dorsal spines, 2 smaller ones at soft dorsal base and fourth on caudal peduncle. Soft vertical fins with small brown spots. Paired fins unspotted. Length 200 mm. (Boulenger)

China, Japan, Kandavu.

Serranus daemelii Günther.

Serranus daemelii Günther: Ann. Mag. Nat. Hist. London, 4th ser., vol. 17, p. 391, 1876 (type loc. Sydney).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 254, 1882 (fresh waters at Normanby Island, D'Entrecastreaux Group, New Guinea).

Epinephelus daemeti Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 76, 1900 (1901) (Guam).

Epinephelus daemelii Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 36, 1906 (Shortland Island, Solomons).

Epinephelus dacmeli Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 259, 1905 (1906) (Apia).

Head 2 2/5; depth 3; D. XI, 14, 1; A. III, 8, 1; scales 98 in lateral line to caudal base and 7 more on latter; tubes 50 in lateral line to caudal base and 5 more on latter; 15 scales above lateral line, 28 below; predorsal scales 58; snout 4 1/4 in head measured from upper jaw tip; eye 6; maxillary 2; interorbital 6. Head width 1 2/3 in its total length; third dorsal spine 3 3/4; third anal spine 4 2/5; least depth of caudal peduncle 3 1/2; caudal 2; pectoral 1 7/8; ventral 2 1/10.

Dark brown generally, spotted finely all over with darker, though spots now rather obscure on dorsals and anals. Margin of spinous dorsal dusky and 5 or 6 large dark blotches on back, last blackish saddle close behind soft dorsal. Dark spots very fine and crowded on cheek. Pectoral and ventral all well spotted. In smaller example spots all larger and blotches on back more extensive, 2 anterior forward as bands with first to eye and snout, and second from spinous dorsal across side of head and maxillary.

In the Bishop Museum 2 from Shortland Island and 1 from Guam. Largest 406 mm.

The Guam specimen differs considerably from Boulenger's figure (Cat. fishes Brit. Mus., vol. 1, p. 223, pl. 7, 1895) in the presence of the large spots Seale describes on the thorax, the dark lateral bands are less inclined, ventral with rather large dark blotches, also under surface of head. Margins of spinous dorsal membranes blackish.

The imperfectly described *Serranus goldiei* Macleay (Linn. Soc. New South Wales, Proc., vol. 7, p. 226, 1882, type loc., New Guinea) is suggestive of this species. The following is condensed from his account:

Head nearly long as rest of body to caudal fin; depth 4 in total; D. X, 14; A. III, 7; eye 2 to mandible tip, more than 4 to opercular flap tip; maxillary reaches far beyond eye; 2 strong canines each side of jaw outside others and very close together; interorbital wide as orbit, little depressed; preopercle rounded, slight emargination above angle, with serrae; median opercular spine acute, others distant and very small. Scales small, lateral line nearly straight. Dorsal spines not long, first shortest, from fourth longest; soft dorsal more elevated. First anal spine short, third little longer than second; rays much longer. Caudal slightly rounded. Pectoral large. Ventral inserted close behind pectoral base, not reaching far back as pectoral tip. Yellowish-brown, covered all over (head, fins and all) with pale brown spots, smaller than interspaces; 2 spots of large size show on back, 1 about end of spinous dorsal, others

over tail; pectoral more sparsely spotted, except at base Length 407 mm.

New Guinea, New South Wales, Guam, Samoa. Reaches 630 mm.

Serranus quernus (Seale).

Epinephelus quernus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 4, p. 3, fig. 1, 1901 (type loc., Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 449, 1902 (1903) (Honolulu).—Snyder: op. cit., p. 527, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 223, figs. 89-90 1903 (1905) (Honolulu).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 46, December, 1922 (Hawaii).

Serranus quernus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 252, 1907 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 14, 1925 (Laysan).

Head 2 1/4 to 2 1/3; depth 2 1/2; D. XI, 14, 1; A. III, 9, 1; scales 122 to 130 in lateral line to caudal base and about 19 more on latter; tubes 66 to 68 in lateral line and 7 more on latter; 19 to 31 scales above lateral line to spinous dorsal origin, 52 to 55 below; 105 predorsal scales; snout 3 1/4 to 3 2/3 in head measured from upper jaw tip; eye 6; maxillary 2 to 2 1/6; interorbital 6.

Body rather deep, compressed. Least depth of caudal peduncle 3 1/2 in total head length. Head large, 2 2/5 in its total length. Snout little wider than long. Eye high, circular, near last 2/3 in head. Mouth large, little oblique, mandible well protruded. Maxillary reaches opposite eye center; expansion 2/3 of eye. Bands of small pointed teeth in upper jaw, enlarged forward and depressible, also outer enlarged series besides several front canines; mandibular teeth biserial, inner row elongated or little longer than outer; bands of small vomerine and palatine teeth. Nostrils close before eye above, posterior larger. Interorbital little convex. Preopercle edge finely serrate behind, with several serrae enlarged at angle and lower edge entire. Preorbital entire. Median opercular spine nearest lower and most backward. Gill rakers 8 or 9+14 or 15, lanceolate, little longer than filaments or 2 to 2 1/5 in eye. Scales largest on sides of body; 36 rows on cheek. Tubes in lateral line simple. Third dorsal spine 2 3/5 in head; ninth dorsal ray 2 2/3; third anal spine 3 1/8; fifth anal ray 2 2/5; caudal 1 3/4, rounded behind; pectoral 2; ventral 2.

Largely uniform dusky-brown, edges of rayed vertical fins paler. Traces of pale spots scattered over trunk, rather sparse and irregular. In some examples with 5 vertical rows of white spots, though no spots in smallest specimens.

In the Bishop Museum the type, 278 mm., obtained August 9, 1901. Also 11 others from Honolulu. I also examined 130 from the Honolulu market in November and December, 1922, and January, 1923. One from Laysan in 1923. One in the Academy from Honolulu.

This species seems to be very closely allied with the American *Serranus niveatus,* its structural characters in fact nearly the same. Quite an outstanding feature is the very large posterior nostril. This is shown in Seale's figure though those by Jordan and Evermann do not indicate much contrast, both representing small specimens. In larger specimens have them 3 or 4 times as large as the anterior, while in the smaller they are hardly twice as large. Boulenger's figure of the young of *Epinephelus niveatus* clearly indicates the hind nostril much the larger.

Serranus septemfasciatus (Thunberg).

Perca septemfasciata Thunberg: Vet. Akad. Handl. Stockholm, vol. 14, p. 56, pl. 1, 1793 (type loc., Nagasaki).

Epinephelus septemfasciatus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 379, 1923 (Honolulu).

Head 2 1/3; depth 2 2/5; D. XI, 15, 1; A. III, 9, 1; scales 103 in lateral line to caudal base and 12 more on latter; tubes 67 in lateral line to caudal base and 10 more on latter; 20 scales above lateral line to spinous dorsal origin, 37 below; 44 predorsal scales; snout 4 in head measured from snout tip; eye 4 4/5; maxillary 2 1/10; interorbital 6 3/4.

Body well compressed, with ovoid contour. Least depth of caudal peduncle 3 1/8 in total head length. Head width 2 1/3 its length. Snout conic, width 3/4 its length. Eye with hind edge midway in its length. Mouth large, well inclined, lower jaw protruding. Maxillary reaches opposite hind pupil edge; expansion 1 1/3 in eye. Teeth in band in upper jaw; lower biserial; pair of small canines at front of each jaw; some of inner longer upper teeth depressible; band of teeth on vomer and on each palatine. Tongue slender, pointed, free in front, smooth. Front nostril at last fourth in snout; hind nostril greatly enlarged pore close to eye. Interorbital evenly convex. Preopercle edge serrate behind, lower edge entire, 2 or 3 slightly enlarged divergent spines at angle. Opercular spines 3, median most posterior and closer to lower. Opercular flap convex along upper edge. Gill rakers v, 2 + 12, III, lanceolate, equal gill filaments, which 2 1/4 in eye. Scales with 3 or 4 radiating basal striae; apical denticles 8 to 11, in 2 or 3 transverse series; circuli rather large; cheek with 25 rows of scales to preopercle angle. Third dorsal spine 2 1/4 in total head length; last spine 3; sixth dorsal ray 2; second anal spine 2 5/6; fifth anal ray 2 1/10; caudal rounded convexly behind, 1 2/3; pectoral 1 3/4; ventral 1 3/4.

Pale uniform brownish generally, without traces of crossbands, without spots or markings. Iris pale slaty. Ventral dusky terminally.

In the Bishop Museum, 1 from Honolulu 138 mm. Not previously reported from Oceania, but widely distributed in the tropical Atlantic, Indian and Western Pacific oceans. Reaches 900 mm.

Macleay has described very incompletely, though in detail, *Serranus magnificus* (Linn. Soc. New South Wales, Proc., vol. 7, p. 229, 1882, type loc., New Guinea). Possibly it may relate to the present species:

Head 3 in total; depth 3 1/2; D. XI, 16; A. III, 9; snout short, broad, rounded, distant from eye, which small, about 1 diameter of orbit; maxillary reaches beyond eye; canines small; interorbital broad, almost flat; preopercle rounded, raggedly serrated, densely covered with minute scales; opercular spines obtuse, median large and flat. Dorsal spines very strong, except first 2, nearly equal; soft dorsal much higher and rounded behind. Anal more pointed behind soft dorsal, spines short, third largest. Caudal rounded. Pectoral large, rounded. Ventral much shorter than pectoral. Olive-green with numerous lighter patches all over, yellow on belly. Fins yellowish, with very numerous large brown spots, with appearance of tortoise shell. Pectoral with 2 brown basal crossbars before commencement of spots. Length 457 mm.

Serranus rhyncholepis Bleeker.

Serranus rhyncholepis Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 749, 1852 (type loc., Celebes).

Head 2 2/5; depth 3; D. XI, 15, 1; A. III, 8, 1. Gill rakers v, 3 + 9, vii, lanceolate.

Two in the National Museum from New Guinea, 244 and 337 mm.

Apparently this species has not been seen since Bleeker described it. Bleeker had 2 specimens and notes it as rare.

Serranus albopunctulatus (Boulenger).

Epinephelus albopunctulatus Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 234, pl. 9, 1895 (type loc., Nukuhiva, Marquesas Islands).

Head 3; depth 2 7/8; D. XI, 16; A. III, 8; scales 120, 16 above, 50 below, pores 75; snout little longer than eye, which 5 in head; maxillary reaches slightly beyond eye; 3 rows of lateral mandibular teeth; interorbital 6 in head. Gill rakers 15 below. Second dorsal spine long, 2 in head. Caudal truncate. Brown, dotted with white, each dot occupying base of scale. Soft dorsal, anal and caudal with narrow pale edge. Spinous dorsal with black edge. Length 210 mm. (Boulenger)

Serranus corallicola Valenciennes.

Serranus corallicola (Kuhl and Van Hasselt) Valenciennes: Hist. nat. Poiss., vol. 2, p. 251, 1828 (no type locality).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 228, 1882 (New Guinea).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 14, 1925 (Wake Island).—Fowler: op. cit., Bull. 38, p. 14, 1927 (Fanning and Christmas islands).

Epinephelus corallicola Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 236, 1896 (Pelew Islands; Mortlock Island; Ponapé; Greenwich Island; Howland Island).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 35, 1906 (Raiatea; Shortland Island; Makatea; Rarotonga; Faté).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 259, 1905 (1906) (Apia).

Serranus miliaris Valenciennes: Hist. nat. Poiss., vol. 6, p. 391, 1830 (type loc., New Guinea).

Serranus howlandi Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 8, pl. 9, fig. B, 1873 (type loc., Howland Island; Tahiti).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 253, 1883 (Hood Bay, New Guinea).

Serranus cruentus De Vis: Linn. Soc. New South Wales, Proc., vol. 8, p. 446, 1883 (type loc., New Britain).

Epinephelus merra (non Bloch) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 258, 1906 (Mangareva).—Bryan and Herre: op. cit., vol. 2, no. 1, p. 130, 1902 (1903) (Marcus Island).

A series of specimens in the Bishop Museum as follows: 6 Shortland Island, 1 Tubuai, 14 Tahiti, 1 Raiatea, 4 Mangareva, 1 Rarotonga, 1 Marcus Island, 2 Makatea and at Palmyra 1 by Charles M. Cooke, Jr., in 1917 and 1 by Thurston and Thaanum in 1922. Also 2 from Wake Island in 1923. An adult from Apia in the National Museum.

Usually distinguished from *Serranus merra* in the more rounded appearance of the dark spots, which variably numerous or otherwise. In most specimens the anterior, or fourth to sixth dorsal spines, are conspicuously elevated above the other spines, especially the last. In *Serranus merra* the dorsal spines are mostly uniform in height after the fourth.

East Indies to Tahiti. Reaches 385 mm.

Serranus nebulosus Valenciennes.

Serranus nebulosus Valenciennes: Hist. nat. Poiss., vol. 2, p. 233, 1828 (type locality unknown).

Serranus moara Schmeltz: Mus. Godeffroy, Cat. 4, p. 12, 1869 (Pelew Islands).

Head 2 2/3 to 2 3/4; depth 3 to 3 1/3; D. XI, 15 to 17; A. III, 8; scales 100 to 110, 10 or 11 above, 40 below, pores 60 to 65; snout longer than eye, which 4 1/2 to 5 in head; maxillary to hind eye edge or slightly beyond; lateral mandibular teeth triserial; interorbital 8. Gill rakers 14 or 15 below. Brownish-gray, body marbled darker. Length 340 mm. (Boulenger)

East Indies, Japan, Pelew Islands.

Serranus merra (Bloch).

Epinephelus merra Bloch: Nat. ausländischen Fische, vol. 7, pt. 10, p. 17, pl. 329, 1793 (type loc., Japanese Sea).—Bleeker: Atlas ichth., vol. 7, p. 55, pl. (33) 301, fig. 2, 1873-76 (Waigiu; New Guinea).—Bleeker: Kon. Akad. Amsterdam, Verh., vol. 14, pt. 2, p. 88, 1874 (Waigiu; New Guinea).—Streets: U. S. Nat. Mus., Bull. 7, p. 92, 1877 (Christmas Island).—Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 241, 1895 (Duke of York Island; Solomons; Aneiteum; Samoa; Fiji; Micronesia).—Waite: Australian Mus., Mem., no. 3, p. 182, 1897 (Funafuti, Ellice Islands).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 372, 1897 (Rotuma).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 485, 1899 (Thornton Island).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 484, 1901 (Samoa).—Garman: Mus. Comp. Zool., Bull., vol. 39, p. 229, 1903 (Suva, Fiji).—Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 130, 1902 (1903) (Marcus Island).—Waite: Australian Mus., Records, vol. 5, p. 3, 1903 (Paanopa, Ocean Island, Gilberts).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 258, 1906 (Tahiti; Mangareva, Gambier Islands).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1377, 1906 (Upolu; Apia).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 258, 1905 (1906) (Apia).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 354, 1906 (Tahiti).—Jordan and Dickerson: op. cit., vol. 34, p. 610, 1908 (Suva, Fiji).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 385, 1911 (Makemo and Rangiroa, Paumotus; Tahiti; Jaluit, Marshalls).—Kendall and Radcliffe: Mus. Comp. Zool, Mem., vol. 35, p. 109, 1912 (Mangareva).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 118, 1922 (Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 9, 33, 1925 (Guam, Samoa).

Serranus merra Valenciennes: Hist. nat. Poiss., vol. 2, p. 243, 1828 (Waigiu; Borabora; Oualan).—Kittlitz: Denkw. Reise Mikronesien, vol. 2, p. 22, fig. (Ulea), p. 115, 1858 (Senjawins Island).—Peters: Akad. Berlin, Monatsb., p. 831, 1876 (1877) (New Ireland).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 14, 1925 (Wake Island).—Fowler: op. cit., Bull. 38, p. 14, 1927 (Fanning, Christmas, Jarvis, Tongareva, Howland, and Baker islands).

Holocentrus hexagonatus Schneider: Systema ichth., Bloch,, p. 323, 1801 (type loc., Tahiti).

Serranus hexagonatus Valenciennes: Hist. nat. Poiss., vol. 2, p. 246, 1828 (Borabora; Oualan).—Valenciennes: op. cit., vol. 6, p. 388, 1830 (Carteret Harbor, New Ireland).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, pp. 2, 3, 4, 1859 (Doreh, New Guinea).—Günther: Cat. fishes Brit. Mus., vol. 1, p. 141, 1859 (Louisiades and Fiji).—Schmeltz: Mus. Godeffroy, Catalog., 12, 1869 (Upolu).—Günther: Mus. Godeffroy, Jour., vol. 2, pt. 1, p. 7, pl. 7, figs. a-b, 1873 (Society Islands; all Polynesia).—Peters: Akad. Wiss. Berlin, Monatsb., p. 831,

1876 (1877) (Pelew Islands).—Günther: Rept. voyage "Challenger," vol. 1, p. 34, 1880 (Levuka, Fiji).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 229, 1882 (New Guinea).—Vaillant: Soc. Philom. Paris, Bull., 7th ser., vol. 11, p. 62, 1886-87 (Society Islands; Paumotus).

Perca hexagonata (Forster) Valenciennes: Hist. nat. Poiss., vol. 2, p. 247, 1828 (Tahiti; name in synonymy).—Lichtenstein: Descriptiones animalium, Forster, p. 189, 1844 (Tahiti).

Epinephelus hexagonatus Pellegrin: Mus. Hist. Nat. Paris, Bull., vol. 4, p. 229, 1898 (Saypan, Rota, Marianes).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 77, 1900 (1901) (Agaña, Guam).—Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 130, 1902 (1903) (Marcus Island).

Epinephelus stellatus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 258, 1905 (1906) (Samoa).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 610, 1908 (Suva, Fiji).

Related to *Serranus fasciatus* but readily distinguished by very numerous dark brown spots everywhere, which separated by a honeycombed network of light lines.

In the Agassiz Museum 7 from the Society Islands through Andrew Garrett, 13 from Apiang in the Gilbert Islands, also 1 labeled Gilbert Islands, through Andrew Garrett. In the Marshall Islands 4 from Ebon Island and 2 from Ascension Island through Rev. A. A. Strong. In the Caroline Islands 1 from Andrew Garrett, 1 from Ponapé through Rev. L. H. Gulick with posterior half bitten off by a shark and 3 from Strong's Island by Rev. B. G. Snow. The Wilkes Expedition obtained 5 at Fiji, 1 Samoa, and 2 without locality likely from Polynesia?, all in the National Museum. Others are 1 Tempe in the Marquesas Islands from W. H. Jones on June 23, 1883, 3 from the *Albatross,* and 5 from William Stimpson at Tahiti, 2 Fanning Islands from T. H. Streets, 14 Apia, 1 Solomon Islands, 2 Makemo, 2 Rangiroa, 2 Mangareva. Largest 234 mm. In the Bishop Museum 3 Agaña on Guam, 1 Faté, 1 Rarotonga, 1 Tubuai, 1 Marcus Island. One from Wake Island and 3 from Guam in 1923. In the Academy 1 Samoa, 20 Apia and 3 Thornton Island.

The most abundant species of the South Seas, reaching 320 mm.

Zanzibar, Mauritius, Andamans, East Indies, China, to the Tuamotus.

Serranus socialis Günther.

Serranus socialis Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 7, pl. 8, fig. B, 1873 (type loc., Society Islands; Paumotus; Kingsmills; Hervey Islands; Samoa).

Epinephelus socialis Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 243, 1895 (types).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 109, 1912 (Maugareva, Gambier Islands).

Head 3 to 3 1/4; depth nearly 3 to 3 1/4; D. XI, 15; A. III, 8; scales 110, 12 or 13 above, 40 to 45 below, tubes 70 to 72; snout equals or little longer than eye, which to 5 1/2 in head; maxillary extends beyond hind eye edge; lateral mandibular teeth triserial; interorbital 7 to 8 in head. Gill rakers 17 or 18 below. Pale gray or brown, with numerous small round dark spots, which blackish on head and anterior part of body, dark brown and more or less confluent into undulous longitudinal lines further back. Dorsal base with 3 or 4 large dark blotches. Fins dark, with light margin, dorsal, anal and caudal with small whitish round spots. Reaches 900 mm. (Boulenger)

One in the National Museum from Mangareva.

Serranus tauvina (Forskål) (fig. 42).

Perca tauvina Forskål: Descriptiones animalium, pp. 11, 39, 1775 (type loc., Djedda, Red Sea).

Epinephelus tauvina Boulenger, Cat. fishes Brit. Mus., vol. 1, p. 244, 1895 (Ponapet, Pelew Islands).—Waite:

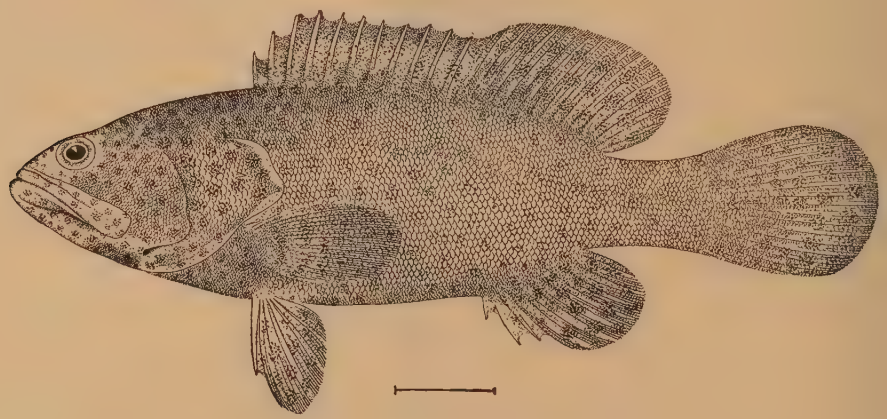

FIGURE 42.—Drawing of *Serranus tauvina.*

Australian Mus., Mem., no. 3, p. 182, 1897 (Funafuti, Ellice Islands).

?Serranus crapao Schmeltz: Mus. Godeffroy, Cat. 4, p. 12, 1869 (Viti).

Serranus salmonoides Schmeltz: Mus. Godeffroy, Cat. 4, p. 12, 1869 (Upolu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 228, 1882 (New Guinea).

Epinephelus gilberti Bleeker: Atlas ichth., vol. 7, p. 56, pl. (53) 331, fig. 3, 1873-76 (Waigiu).

?Homalogrystes guntheri Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 269, pl. 9, fig. 3, 1876 (type loc., about twelve miles south of New Guinea coast at Katow).

Serranus salmoides Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 9, 1885 (Rubi, New Guinea).

Epinephelus fuscoguttatus (non Forskål) Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 502, 1900 (type

of *Serranus phaeostigmaeus*).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (same type).

Serranus phaeostigmaeus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 255, fig. 2, 1907 (type loc., Hawaiian islands).

Head 2 1/8; depth 3 1/2; D. XI, 14, 1; A. III, 8, 1; scales 108 in lateral line to caudal base and 7 more on latter; tubes 60 in lateral line to caudal base and 3 more on latter; scales 13 above lateral line, 24 below; 75 predorsal scales (not counting fine auxiliaries); snout 4 2/5 in head measured from upper jaw tip; eye 7 3/5; maxillary 2; interorbital 7 1/2. Least depth of caudal peduncle 4 1/3 in total head length. Head width 3 in its length. Snout conic, length 3/4 its width. Maxillary nearly reaches eye diameter beyond eye; expansion equals eye. Gill rakers VII, 1+7, VIII, short, rather robust, 4/5 of gill filaments, which 2 1/8 in eye. Scales with 11 or 12 basal radiating striae; circuli coarser apically. Third dorsal spine 4 1/10 in total head length; fourth dorsal ray 3 3/4; third anal spine 6; third anal ray 3 1/5; caudal 2 2/5; pectoral 2 1/3; ventral 3 1/8.

Dark brown generally, marbled with darker. Back with 6 blackish saddles, last on caudal peduncle above. Fins all dusky, at least terminally and all but pectoral with obscure blackish spots. All fins narrowly white-edged.

One in the Bishop Museum from Palmyra Island, 458 mm., obtained November 20, 1917.

The type of *Serranus phaeostigmaeus* appears to agree better with this species than any other. It has 3 series of lateral mandibular teeth. Length 217 mm. Collection of the Academy.

Red Sea, Zanzibar and Natal to India, East Indies, China to the Carolines, Ellice Group and Hawaii. Reaches 1270 mm.

Serranus caeruleo-punctatus (Bloch).

Holocentrus caeruleo-punctatus Bloch: Nat. auslandischen Fische, pt. 4, p. 94, pl. 241, fig. 2, 1790 (no type locality).

Epinephelus coeruleopunctatus Bleeker: Kon. Akad. Amsterdam, Verh., vol. 14, ser. 2, p. 108, 1874 (New Guinea; Waigiu).—Bleeker: Atlas ichth., vol. 7, p. 62, pl. (6) 284, fig. 1, 1873-76 (Waigiu; New Guinea).

Epinephelus caeruleopunctatus Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 246, 1895 (Ponapé).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 36, 1906 (Shortland Island, Solomons).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 285, 1911 (Jaluit, Marshalls).

Serranus hoevenii Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, p. 297, 1868 (Kandavu, Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 12, 1869 (Kandavu).

Grammistes sexfasciatus (non Bloch) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 38, 1906 (Shortland Island).

Head 2 1/2; depth 3 1/8; D. XI, 15, 1; A. III, 8, 1; scales 78 in lateral line to caudal base and 8 more on latter; tubes 58 in lateral line to caudal base and no more on latter; 15 scales above lateral line to spinous dorsal origin, 24 below, 60 predorsal; snout 4 1/5 in head measured from upper jaw tip; eye 5 3/4; maxillary 2 2/5; interorbital 6. Head width 2 in its total length; eleventh dorsal spine 3; second anal spine 3; least depth of caudal peduncle 3 2/5; caudal 1 3/4; pectoral 1 2/3; ventral 2 1/10. Dark brown. Fins dusky to blackish. Body mottled or obscurely splashed or spotted with whitish or deeper brownish, sometimes several obscure dark blotches on back. Blackish line in maxillary groove. Length 126 to 184 mm.

In the Bishop Museum 3 from Shortland Island. These agree with Day's figure of *Serranus tumilabrus* (Fishes of India, pt. 1, p. 16, pl. 3, fig. 3, 1875). In the Agassiz Museum 1 from the Marquesas Islands. Reaches 560 mm.

Zanzibar, Mauritius, Seychelles, India, East Indies, Caroline Islands, Marshall Islands.

Serranus summana (Forskål).

Perca summana Forskål: Descriptiones animalium, pp. 11, 42, 1775 (type loc., Arabia).

Serranus summana Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, p. 297, 1868 (Kandavu, Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 12, 1869 (Kandavu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 228, 1882 (New Guinea).

Epinephelus summana Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 248, 1895 (Ponapé).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 111, 1913 (Saonek, Waigiu).

Serranus alboguttatus Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).

Epinephelus alboguttatus Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).

Serranus ongus Peters: Akad. Wiss. Berlin, Monatsb., p. 831, 1876 (1877) (New Guinea).

Epinephelus tumilabris Pellegrin: Mus. Hist. Nat., Paris, Bull. 4, p. 229, 1898 (Guam).

Epinephelus maculatus (non Bloch) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 35, 1906 (Makatea, Paumotus).

Head 2 3/5; depth 3 1/5; D. XI, 15, 1; A. III, 8, 1; scales 91 in lateral line to caudal base and 12 more on latter; tubes 70 in lateral line to caudal base and 5 more on latter; 17 scales above lateral line, 30 below; 62 predorsal scales; snout 4 4/5 in head measured from upper jaw tip; eye 5 3/4; maxillary 2; interorbital 6 2/3. Least depth of caudal peduncle 3 in total head length. Head width 2 in its length. Fourth dorsal spine 3 in head; third anal spine 3 2/5; caudal 1 3/4; pectoral 1 2/3; ventral 2. Warm or sepia-brown, finely spotted with dusky-brown, these markings forming more or less as streaks along body posteriorly and on caudal peduncle. Head below, breast and belly nearly immaculate. Fins largely dusted and most with dusky terminally, edges narrowly white.

In the Bishop Museum 1 from Rarotonga 278 mm. and 1 from Makatea 153 mm. In the Agassiz Museum 1 from the Society Islands through Andrew Garrett.

These specimens very similar in pattern to Bleeker's figure of *Epinephelus bataviensis* (Atlas ichth., vol. 7, pl. 4, fig. 2, 1873-76) except he shows the markings reversed or as pale while in my specimens they are dark. His figure also shows the maxillary unspotted as well as the pectoral. In my specimen the axilla is especially spotted. Reaches 330 mm.

Red Sea and Zanzibar to the East Indies to the Carolines and Tuamotus.

Serranus fuscoguttatus (Forskål) (Pl. XV, *A*).

Perca summana fusco-guttata Forskål: Descriptiones animalium, pp. 11, 42, 1775 (type loc., Suerens, Djedda).

Epinephelus fuscoguttatus Bleeker: Kon. Akad. Amsterdam, Verh., vol. 14, ser. 2, p. 93, 1874 (Waigiu).—Bleeker: Atlas ichth., vol. 7, p. 57, pl. (29) 307, fig. 3, 1873-76 (Waigiu).—Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 249, 1895 (Hope Island; Tongatabu; Samoa; Greenwich Island; Meduro).—Waite: Australian Mus., Mem., no. 3, p. 545, 1899 (Funafuti, Ellice Islands).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 259,

1905 (1906) (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 285, 1911 (Makemo: Paumotus; Funafuti, Ellice Islands; Rongelab, Marshalls; Rangiroa, Paumotus).

Serranus fuscoguttatus Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 228, 1882 (New Guinea).—Fowler: B. P. Bishop Mus., Bull. 38, p. 14, 1927 (Fanning Island).

Epinephelus horridus Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).

Serranus dispar Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 9, 1873 (Marshall Group).—Günther: Rept. voyage "Challenger," vol 1, p. 58, 1880 (Tongatabu).

Epinephelus microdon Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 253, 1883 (Engineer Group, New Guinea).

Head 2 2/5; depth 2 2/3; D. XI, 15, 1; A. III, 8, 1; scales 102 in lateral line to caudal base and 5 more on latter; tubes 65 in lateral line to caudal base and 3 more on latter; 18 scales above lateral line to spinous dorsal origin, 30 below; 70 predorsal scales to eyes; snout 4 1/5 in head measured from upper jaw tip; eye 5 7/8; maxillary 2; interorbital 6 3/4.

Body elongately ovoid, deepest about middle of depressed pectoral, well compressed. Caudal peduncle well compressed, length 1 1/5 in its least depth, which 3 1/2 in total head length. Head rather pointed in profile, sides convex, slightly approximated above, width half its length. Snout convex, length 4/5 its width. Eye high, anterior, hind edge at first 2/5 in head length. Mouth little inclined from horizontal, lower jaw well protruded. Maxillary long, oblique, extends slightly beyond eye; expansion 1 2/3 in eye. Teeth in broad bands in jaws, 5 series anteriorly and narrowing to 2 series posteriorly or towards rictus; no canines; bands of similar teeth on vomer and palatines. Tongue small, smooth, rounded, free in front. Nostrils close together, internasal septum at last fourth in snout; hind nostril 3 times size of front one. Interorbital nearly level or with slight convexity behind due to rising cranium. Preopercle edge irregularly rough, with 2 broad blunt points at angle. Only median opercular spine distinct. Gill rakers IX, 1+4, X, lanceolate, longest equal gill filaments, which 2 1/4 in eye.

Scales small, cover head except lips; larger scales with numerous auxilaries; fine scales on rayed fins, at least basally; basal radiating striae 9 to 13; apical denticles 9 to 41, transverse basal series 4 or 5; circuli fine basally, otherwise longitudinally parallel. Lateral line complete, arched nearly parallel with dorsal profile of back, tubes small and simple. Spinous dorsal origin begins little behind that of pectoral, spines graduated up to third after which subequal; first spine 7, third spine 3 2/5 in head. Soft dorsal higher, rounded, fifth ray 2 2/3. Anal spines small, third longest, with second but little shorter, 5 1/3 in head; fin origin slightly behind that of soft dorsal. Soft anal rounded, fourth ray 2 4/5 in head. Caudal rounded convexly behind, 2 1/8 in head. Pectoral broad, median rays longest, 2 in head, fin rounded. Ventral inserted slightly before pectoral origin, fin not quite reaching half way to anal, 2 2/5 in head; spine about half of fin. Vent snout length before anal.

Deep dusky-brown generally. Fins all become more or less dusky to blackish terminally. Body and fins everywhere with small and very numerous close-set rounded spots, each with slightly grayish center. Along bases of dorsals 5 obscure dusky or deeper brown blotches and blackish saddle on upper surface of caudal peduncle. Iris dull slaty.

One in the Bishop Museum, 541 mm. long from Palmyra Island. It agrees most closely with Bleeker's figure of *Epinephelus microdon* (Atlas ichth., vol. 7, pl. 281 [3], fig. 3, 1873-76).

In the Agassiz Museum 1 from Ponapé in the Carolines through Rev. L. H. Gulick. Also 4 from the Gilbert Islands through Andrew Garrett, 1 Ebon Island, Marshall Islands, and 1 from Makemo in the Tuamotus.

Mauritius, Zanzibar, Seychelles, East Indies to the Tuamotus.

Serranus lanceolatus (Bloch).

Holocentrus lanceolatus Bloch: Nat. ausländischen Fische, pt. 4, p. 92, pl. 242, fig. 1, (1790) (type loc., East Indies).

Epinephelus lanceolatus Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., 4th series, vol. 16, no. 20, p. 654, 1927 (Honolulu).

Head 2 3/4 to 3 1/4; depth 2 3/4 to 3 1/4; D. XI, 14 or 15; A. III, 8; scales 100 to 110, 14 or 15 above, 42 to 50 below, pores 58 to 67; eye 5 (young) to 12 in head, snout very short; maxillary extends beyond eye; interorbital 4 to 5 1/2 in head. Gill rakers 14 below. Young yellowish or orange, with 4 dark brown cross-bands of which first and second join behind opercle. Fins with few blackish-brown spots. Bands disappear when half grown, body reticulated with dark brown, meshes of network enclosing lighter spots and spots on fins more numerous. Uniform brown with age. Reaches 3660 mm. (12 feet). (Boulenger)

In the Agassiz Museum 1 from Apiang in the Gilbert Group, 134 mm. long.

East Africa to India, East Indies, Gilbert Islands and Hawaii.

Anyperodon leucogrammicus (Valenciennes).

Serranus leucogrammicus (Reinwardt) Valenciennes: Hist. nat. Poiss., vol. 2, p. 259, 1828 (type loc., Moluccas and Seychelles).

Anyperodon leucogrammicus Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 230, 1882 (New Guinea).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 257, 1905 (1906) (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 284, 1911 (Funafuti, Ellice Islands).

Head 2 2/3 to 2 4/5; depth 3 2/5 to 3 2/3; D. XI, 14 or 15; A. III, 9; scales 120 to 135, pores 75 to 85, 12 to 15 above, 55 to 65 below; snout 1 1/2 to 1 2/3 long as eye, which 6 to 6 1/2 in head; interorbital 8 to 9 1/2; preopercle finely serrated. No palatine teeth. Lower gill rakers 10 or 11 and rudiments. Brown or reddish, with darker spots or reticulations. Head and body with 3 or 4 bluish stripes, become absent with age. Length 520 mm. (Boulenger)

In the National Museum 4 from Apia and 1 Funafuti.

Zanzibar, Seychelles, East Indies, Samoa.

ANTHIINAE

Chelidoperca margaritifera Weber.

Chelidoperca margaritifera Weber: Siboga Exped., vol. 65, p. 207, 1913 (type loc., between Misol and New Guinea in S. Lat. 2° 28′ .5, E. Long. 131° 3′ .3 in 118 m.).

Head 3; depth 4 1/5; D. X, 10; A. III, 6; scales 43, 3 above, 10 below; eye 3 in head, little longer than snout; maxillary reaches hind pupil edge. Gill rakers 12. Cheek with 4 rows of scales. Reddish brown, fins and head pale. Dull yellowish band from gills to caudal peduncle. Below band 12 pearly blotches, also spots above form 2 indistinct rows. Length 62 mm. (Weber)

Probably not distinct from *Chelidoperca hirundinacea* (Valenciennes). Described by Boulen-

ger with "a series of four or five oblong black spots along the side of the body, disappearing in the adult." He gives dimensions 130 to 175 mm.

Caesioperca thompsoni Fowler (fig. 43).

Caesioperca thompsoni Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 379, 1923 (type loc., Honolulu).

Caesoperca thompsoni Fowler: Bishop Mus., Bull. 22, p. 25, 1925 (Honolulu).

Only known from the type in the Bishop Museum. Rosy pink, uniform, fins yellowish. Length 200 mm.

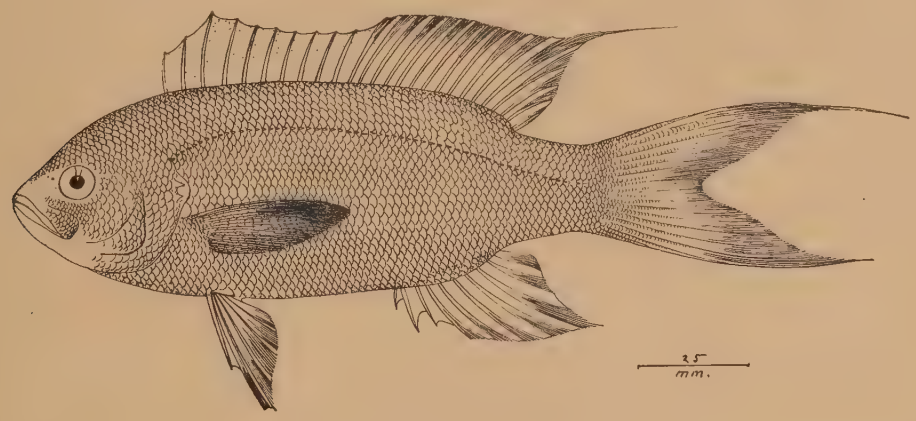

FIGURE 43.—Drawing of *Caesioperca thompsoni*.

Caprodon longimanus (Günther) (Pl. XV, *B*).

Anthias longimanus Günther: Cat. fishes Brit. Mus., vol. 1, p. 94, 1859 (no type locality).

Caprodon longimanus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 379, 1923 (Honolulu).—Fowler: Bishop Mus., Bull. 22, p. 25, 1925 (Honolulu).

Head 3 2/3 to 3 3/4; depth 2 3/5 to 3; D. X, 19 or 20; A. III, 8; scales 68 to 75, 6 above, 23 to 25 below, pores 63 to 65; snout equals or little shorter than eye, which 3 1/2 to 4 in head; maxillary nearly reaches eye center. Gill rakers 26 below. Pink with yellow spots or irregular oblique stripes. Two yellow stripes in front of eye to pectoral base. Dorsal and anal yellow and red, former sometimes with irregular black blotches. Length 385 mm. (Boulenger)

In the Bishop Museum 7 from Honolulu, 363 to 432 mm. Not previously recorded from Hawaii and known previously from the South Pacific from New South Wales to Juan Fernandez. My material agrees with Boulenger's figure (Cat. fishes Brit. Mus., vol. 1, pl. 12, 1895) in the very long pectoral, which is shown as 1/3 greater than head length. *Caprodon schlegelii* differs in the truncate caudal, which may have slightly convex hind border.

Caprodon schlegelii (Günther).

Anthias schlegelii Günther: Cat. fishes Brit. Mus., vol. 1, p. 93, 1859 (on Caprodon Schlegel, Fauna Japonica, Poiss., pts. 2-4, p. 64, pl. 30, 1843 (type loc., Japan).

Caprodon schlegeli Jordan and Snyder: (U. S.) Bur. Fish., Bull., vol. 26, p. 211, pl. 12, fig. 1, 1906 (1907) (Honolulu).

Head 3 1/2; depth 2 3/5 to 2 2/3; D. X, 20; A. III, 8 or 9; snout little longer than eye, which 4 to 4 1/3 in head; maxillary to below eye center. Pink, with 2 yellow stripes in front of eye and another running obliquely from below eye to pectoral base. Anal with round yellow spots. Few irregular black blotches on spinous dorsal. Length 370 mm. (Boulenger)

An adult specimen in the National Museum obtained by Berndt in Honolulu. This was compared with Japanese specimens by Jordan and Snyder and no specific differences were noted.

Anthias margaritaceus Hilgendorf.

Anthias margaritaceus Hilgendorf: Ges. Naturf. Freund. Berlin, Sitz., p. 78, 1879 (type loc., Japan, probably Sagami Bay).

Anthias mortoni Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 253, 1884 (type loc., Pitt Bay, Moresby Island, New Guinea).

Depth 4 in total; D. X, 17; A. III, 8; scales 40, 4 above, 13 below. Snout shorter than eye. Mouth oblique, small. Maxillary broad, triangular, reaches middle of eye. Interorbital convex, nearly twice orbit. First dorsal spine small, second little longer, third produced in filament, which 3 times following ones. Second and third anal spines subequal, third and fourth rays elongate. Caudal long and forked, lobes produced. Slate blue in life, with crimson stripe on gills, flame color fins and tail, latter with light edge. Eye green. (Macleay)

Japan, New Guinea.

Anthias squamipinnis (Peters).

Serranus (*Anthias*) *squamipinnis* Peters: Arch. Naturgesch., vol. 1, p. 236, 1855 (type loc., Mozambique).

Anthias cheirospilos Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 225, 1882 (New Guinea).

Head 3 1/2; depth 2 2/3 to 3; D. X, 17 or 18; A. III, 7 or 8; scales 40 to 44, 2 or 3 above, 15 or 17 below; snout shorter than eye, which 3 to 3 1/2 in head. Lower jaw projects. Maxillary reaches below hind third of eye. Preopercle serrae slightly enlarged at rounded angle. Opercular spines 2. Soft dorsal and anal pointed. Caudal emarginate, outer rays filamentous. Red, with bluish streak from below eye to pectoral base. Fins yellowish-red, with dark network enclosing roundish light spots. Length 100 mm. (Boulenger)

Two in the National Museum from New Guinea, 77 and 78 mm. long.

Red Sea, East Africa, East Indies.

Anthias manadensis Bleeker.

Anthias manadensis Bleeker: Soc. Sci. Ind. Neerl., Act. (Manado), vol. 1, p. 39, 1856 (type loc., Manado, Celebes).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 225, 1882 (New Guinea).

Differs from *Anthias squamipinnis* in the third dorsal spine scarcely longer than fourth and soft dorsal and

anal more rounded. Red above, golden on sides, with rose colored streaks. Dorsal, anal, caudal and ventral orange with whitish edge. Soft dorsal dotted with yellow. Length 106 mm. (Boulenger)

East Indies.

Anthias hypselosoma (Bleeker).

Pseudanthias hypselosoma Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. (36) 58, pl. 2, fig. 2, 1878 (type loc., New Guinea).

Head 3 to 3 1/4; depth 2 1/2; D. X, 16; A. III, 7; scales 47 to 50, 4 above, 15 to 18 below, pores 44 to 46; snout nearly equals eye, which 4 in head, equals or slightly less than interorbital. Lower jaw slightly projects. Maxillary reaches eye center or little beyond, expansion 3/4 of eye. Preopercle serrae enlarged at angle. Subopercle and interopercle serrated. Opercular spines 3. Gill rakers 27 on lower branch. Caudal moderately emarginate. Uniform, red in front, yellow behind. Blue-white streak from below eye to pectoral base. Length 95 mm. (Boulenger)

East Indies, Lord Howe Island.

Anthias pleurotaenia Bleeker.

Anthias pleurotaenia Bleeker: Soc. Sci. Ind. Neerl. Act. (Amboina), vol. 2, p. 34, 1857 (type loc., Amboina).—Waite: Australian Mus., Records, vol. 5, p. 3, 1903 (Nauru, Pleasant Island, Marshall Group).

Head 3 1/3 to 3 4/5; depth 2 2/5 to 3; D. X, 17; A. III, 7; scales 48 to 52, 4 above, 18 to 20 below; snout shorter than eye, which 3 1/3 to 3 3/4 in head; interorbital equals or slightly greater than eye. Lower jaw slightly projecting. Maxillary reaches below center or to hind third of eye. Preopercle serrae slightly enlarged at angle, which rounded. Opercular spines 3. Third anal spine little longer than second. Caudal bifid, lobes pointed. Red or reddish-brown, fins yellowish. Curved silvery or pale blue streak from below eye to caudal, passing under pectoral and second from behind pectoral to caudal. Dorsal and anal bases purplish. Length 134 mm. (Boulenger)

Red Sea?, East Indies, Northeast Australia, Marshalls.

Anthias kelloggi Jordan and Evermann.

Anthias kelloggi Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 179, 1902 (1903) (type loc., off Kailua).—Fowler: B. P. Bishop Mus., Bull. 22, p. 25, 1925 (Honolulu).

Pseudanthias kelloggi Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 226, fig. 92, 1903 (1905) (types).

Zalanthias kelloggi Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., 4th series, vol. 14, no. 20, p. 654, 1927 (Honolulu).

In the Bishop Museum 7 specimens from Honolulu, largest 215 mm. Type of *Anthias kelloggi* in the National Museum.

I am unable to detect any differences between the description of the nominal Japanese species, and therefore *Pseudanthias azumanus* Jordan and Richardson may be merged as a synonym. No comparisons have ever been made. As there are no characters of importance or which are not covered by my Hawaiian material, with the descriptions of Boulenger and Jordan and Richardson, one fails to find specific distinctions. Jordan and Evermann simply admitted their *Anthias kelloggi* to be allied with *Pseudanthias japonicus* (Steindachner and Döderlein), though as they could find no distinctions themselves have never advanced any.

Symphysanodon typus Bleeker.

Symphysanodon typus Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 61, pl. 3, fig. 1, 1878 (type loc., New Guinea).

Propoma roseum Günther: Rept. voyage "Challenger," vol. 1, p. 39, pl. 20, fig. B, 1880 (type loc., off Ki Islands in 129 fathoms).

Rhyacanthias carlsmithi Jordan: U. S. Nat. Mus., Proc., vol. 59, p. 647, figs. 3-4, 1921 (type loc., "Hawaii").

Head 3 1/4; depth 4 2/3; D. IX, 9; A. III, 7; scales 40 in lateral line to caudal base and 4 more on latter; 5 scales above lateral line to spinous dorsal origin, 11 below to spinous anal origin; 23 predorsal scales; snout 4 1/6 in head; eye 2 3/5; interorbital 3 1/5.

Body elongate, strongly compressed, deepest about pectoral origin. Caudal peduncle strongly compressed, least depth 2 1/4 in its length or 3 in head. Head width 2 1/6 its length, rather deep, flattened sides slightly converging below. Snout short, obtusely convex, length about 4/5 its width. Eye very large, much greater than snout, but little less than postorbital. Mouth moderate, lower jaw slightly included. Maxillary moderate, free, reaches eye center; expansion 3 in eye. Row of minute teeth along edge of each jaw and few vestigeal on vomer. Interorbital broadly convex. Preopercle edge finely serrate behind, ends in rather strong spine at angle and 2 weak concealed spines on lower edge posteriorly. Opercle ends in single strong spine.

Gill opening forward to eye-center. Gill rakers 8 + 21, finely lanceolate, 2 in eye; gill filaments 2 in gill rakers. Pseudobranchiae long as gill filaments. Isthmus narrowly constricted, trenchant keel forward.

Scales in even longitudinal rows, become smaller about caudal base. Cheek with 5 rows of scales to preopercle keel. Head largely scaled, 2 rows on maxillary. Scales with 20 parallel basal striae; apical denticles 20. Lateral line of simple tubes, runs high along back, falling midway on caudal peduncle then to caudal base.

Spinous dorsal inserted little behind pectoral origin, fifth spine 1 5/6 in total head length. Soft dorsal origin midway between hind eye edge and caudal base, fin rounded, first ray 1 7/8 in head. Third anal spine 2 1/4. Soft anal rounded, fourth ray 2 1/10. Pectoral not quite reaching far back as tip of depressed ventral, 1 2/5 in head. Ventral reaches vent, 1 1/3 in head, spine 3/4 of fin. Vent close before anal.

Dull brownish generally. Spinous dorsal dusky terminally. Under a lens back and upper surface all finely dusted with close minute dusky dots. Iris dull slaty. Length 58 mm.

Described above from a paratype of *Rhyacanthias carlsmithi* from Aliki, Kau District, Hawaii, obtained by T. Reinhardt, October, 1919, now in the Bishop Museum. In the National Museum the type and 3 paratypes of *Rhyacanthias carlsmithi* with the date October 6, 1919. The type, a dried specimen about 210 mm., shows the maxillary quite distinct from the sheath of the preorbital.

In the original account of *Symphysanodon typus* the preopercle edge is given as denticulate. In the account of *Rhyacanthias carlsmithi* "the vertical and horizontal limbs entire, or nearly so," though I find the edge denticulate (Copeia, no. 142, pp. 39-40, May 20, 1925).

Odontanthias fuscipinnis (Jenkins).

Anthias fuscipinnis Jenkins: U. S. Fish. Comm., Bull., vol. 19, p. 389, fig. 3, 1899 (1901) (type loc., Honolulu).—Jenkins: op. cit., Bull., vol. 22, p. 450, 1902 (1903) (Honolulu).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 942, 1904 (Honolulu).—Snyder: U. S. Fish Comm., Bull., vol. 22, p. 527, 1902 (1904) (Honolulu).

Odontanthias fuscipinnis Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 225, fig. 91, pl. 15, 1903 (1905) (Honolulu; Hilo; Kailua).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 25, 1925 (Honolulu).

In the Bishop Museum 13 from Honolulu, largest 228 mm. I also found 3 in the Honolulu market December 25, 1922. The National Museum contains the type of *Anthias fuscipinnis*, besides 3 examples from Honolulu. One in the Academy from Honolulu.

Though placed in *Odontanthias* by Jordan and Evermann, *Anthias fuscipinnis* differs in the scaly bases of all the dorsal and anal fins.

Odontanthias elizabethae Fowler (fig. 44).

Odontanthias elizabethae Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 379, 1923 (type loc., Honolulu).—Fowler: B. P. Bishop Mus., Bull. 38, p. 15, 1927 (Honolulu).

Dorsal spines slender, edge of fin notched, first spine shortest or little over half of last, third longest after which more or less subequal to last. Soft dorsal with all of anterior rays elevated and filamentous, third longest and reaches far back as opposite tips of median caudal rays. Third anal spine longest, second subequal and median soft rays longest and fin rounded. Caudal strongly forked, with long slender lobes ending in long filaments, long as trunk without head. Pectoral reaches opposite second anal ray base and median rays longest. Ventral with first ray filamentous, tip reaching base of fifth anal ray.

Besides the type and 3 paratypes in the Bishop Museum I obtained 12 in the Honolulu market December 23, 1922. When fresh, the color is brilliant red. In the original description I omitted an account of the fins.

Differs from *Odontanthias fuscipinnis*, aside from color, in the lower third dorsal spine, larger scales (37 compared with 47) and fewer dorsal rays (14 compared with 17).

Grammatonotus laysanus Gilbert.

Grammatonotus laysanus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 619, fig. 240, 1903 (1905) (type loc., near Laysan Island, 97 to 199 fathoms).

Head 3; depth 3 1/8; D. XI, 8; A. III, 9; tubes in lateral line 18, scales 25 or 26, transversely 10 or 11; snout 6 1/2 in head from snout tip; eye 2 1/2; maxillary not quite to front pupil edge, 2 1/2; interorbital 3 1/2. Gill rakers 20 below. Light purplish-red above, silvery below. Few minute scattered blue spots on hind half of caudal peduncle. Projecting membrane tips of spinous dorsal yellow. Anal margined yellow. Pectorals translucent, other fins light purplish-red. Length 38 mm. (Gilbert)

Only known from the type, evidently immature. Closely related to *Callanthias* Lowe.

GRAMMISTINAE

Pogonoperca punctata (Valenciennes).

Grammistes punctatus Valenciennes: Hist. nat. Poiss., vol. 6, p. 379, 1830 (type loc., Vanicolo; Batavia).—Kittlitz: Denkw. Reise Mikronesien, vol. 2, p. 160, 1858 (Ulea).—Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 11, pl. 11, fig. B, 1873 (Society Islands).

Head 2 4/5 to 3; depth 2 1/4 to 2 1/3; D. VII or VIII, 12 or 13; A. III, 8; scales 60 to 65; snout equals eye, which 4 1/2 in head; maxillary to below hind eye edge; interorbital 6 or 7 in head. Gill rakers 8 or 9 and some rudiments below. Brown, with more or less numerous bluish-white dots and 5 large transverse black blotches. Except uniform yellowish spinous dorsal bluish-white dots confined to fin bases. Length 230 mm. (Boulenger)

East Indies, Carolines, Society Islands.

Grammistes sexlineatus (Thunberg).

Perca sexlineata Thunberg: Kon. Vet. Akad. Handl. Stockholm, vol. 13, p. 142, pl. 5, 1792 (type loc., Abbor Slagtet).

Grammistes sexlineatus Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 347, 1895 (Solomons; Aneiteum).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 372, 1897 (Rotuma Island).—Waite: Australian Mus., Mem., no. 3, p. 545, 1899 (Funafuti, Ellice Islands).—Steindachner: Akad. Wiss. Wien, Sitz., vol.

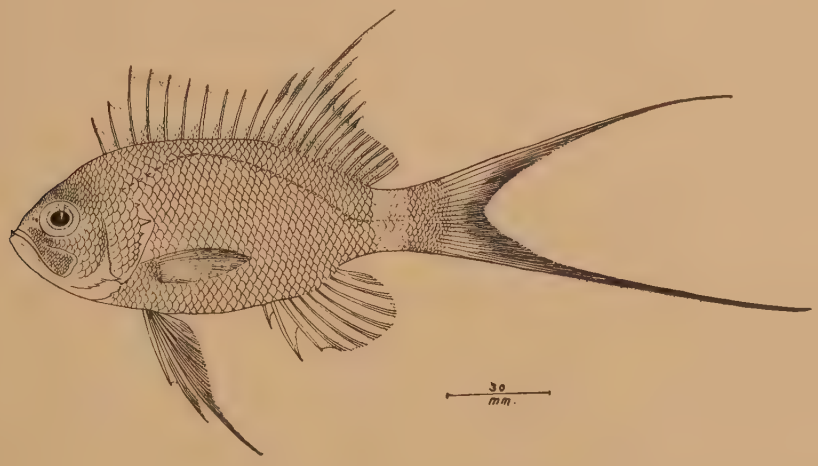

FIGURE 44.—Drawing of *Odontanthias elizabethae*.

115, pt. 1, p. 1378, 1906 (Upolu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 260, pl. 38, fig. 2, 1905 (1906) (Apia).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 112, 1913 (Saonek, Waigiu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 9, 1925 (Guam).

Grammistes orientalis Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, pp. 3, 4, 1859 (Doreh, New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 13, 1869 (Samoa; Viti).—Günther: Cruise of "Curacoa," p. 409, 1873 (Solomons).—Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 10, 1873 (Paumotus; Kingsmills).—Bleeker: Atlas ichth., vol. 7, p. 70, pl. (59) 337, fig. 4, 1873-76 (New Guinea).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).

Grammistes sexfasciatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 38, 1906 (Tahiti; Shortland Island; Nukuhiva).

Head 2 2/3 to 2 3/4; depth 2 1/2 to 2 2/3; D. VII, 14, 1; A. II, 8, 1; tubes 65 to 70 in lateral line to caudal base; 10 or 11 scales above lateral line, 25 to 33 below; about 40? predorsal scales; snout 4 to 5 in head measured from upper jaw tip; eye 4 to 4 7/8; maxillary 1 5/6 to 2; interorbital 5 1/2 to 7 1/2. Least depth of caudal peduncle 2 1/2 to 2 3/5 in total head length. Head width 2 to 2 1/8 its length. Third dorsal spine 2 7/8 to 3 in head; sixth dorsal ray 2 to 3 1/4; fifth anal ray 2 3/5; caudal fin 1 4/7 to 1 3/5; pectoral 1 2/3 to 1 5/6; ventral 2 to 2 1/3.

Dark brown with 4 broad white longitudinal bands, also maxillary narrower one from pectoral axil toward anal base. White line from snout tip to dorsal origin. Fins all pale brown.

In the Bishop Museum 1 from Marcus Island, 1 Tahiti, 1 Nukuhiva, 1 Tubuai, 1 Shortland Island, 1 Guam. Length 82 to 155 mm. In the National Museum 1 from Apia. In the Agassiz Museum 4 from the Society Islands through Andrew Garrett, 1 Ebon Island, through Rev. B. G. Snow, and 2 from Apiang in the Gilbert Islands, and 5 from Ascension Island, Marshall Islands, both by Rev. A. A. Strong. Largest 160 mm.

Zanzibar, Mauritius, India, East Indies, Australia, Formosa to the Tuamotus. Reaches 200 mm.

PLESIOPSINAE

Paraplesiops bleekeri (Günther).

Plesiops bleekeri Günther: Cat. fishes Brit. Mus., vol. 3, p. 364, 1861 (type loc., habitat? [Norfolk Island]).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 87, 1874 (South Sea).

Head 3; depth 3; D. XII, 9 or 10; A. III, 10; scales 50 to 58, 1 above, 16 to 20 below; pores in upper lateral line 36 to 38, in lower 11 to 15; snout 2/3 to 4/5 of eye, which 3 to 3 1/2 in head; maxillary reaches below hind third of eye; interorbital 3 1/2 to 4 in head. Gill rakers 13 below. Orange, with 4 broad, vertical, purplish-black bars. Head with some blue spots, also bases of dorsal and anal. Pectorals yellow, other fins purple, at least terminally. Length 325 mm. (Boulenger)

East coast of Australia. Günther reports it from the southern part of the South Pacific.

Plesiops nigricans (Rüppell).

Pharopteryx nigricans Rüppell: Atlas Reise Nord. Afrika, p. 15, pl. 4, fig. 2, 1828 (type loc., Mohila).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 38, 1906 (Shortland Island, Solomons).—Jordan and Seale: B. P. Bishop Mus., Bull. 22, pp. 9, 33, 1925 (Guam, Samoa).—Fowler: B. P. Bishop Mus., Bull. 38, p. 15, 1927 (Howland and Baker islands).

Plesiops nigricans Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 20, 1869 (Samoa).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).—Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 340, 1895 (Fiji, Tonga, Samoa, Micronesia).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 372, 1897 (Rotuma).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1378, 1906 (Savaii, Samoa).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 112, 1913 (Saonek, Waigiu).

Plesiops woodlarkensis Thiollière: Fauna Woodlark, p. 160, 1857 (type loc., Woodlark Island).

Plesiops corallicola Günther: Cat. fishes Brit. Mus., vol. 1, p. 364, 1859 (Fiji, Tonga).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 20, 1869 (Samoa).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 87, pl. 58, fig. B, 1874 (Samoa, Tonga, Fiji, Pelew Islands, Kingsmills).—Günther: Rept. voyage "Challenger," vol. 1, p. 35, 1880 (Levuka, Fiji).

Plesiops coeruleolineatus Bleeker: Soc. Sci. Ind. Neerl., Act. no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 20, 1869 (Samoa).

Plesiops nigricans var. *apoda* Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, p. 346, 1868 (type loc., Savay, Samoa; Kandavu).

Pharopteryx melas Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 261, pl. 38, fig. 3, 1905 (1906) (Apia; Pago Pago).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 118, 1922 (Pago Pago).

[*Plesiops melas* Regan: Zool. Soc. London, Proc., pt. 1, p. 403, 1909 (Christmas Island, Indian Ocean).]—Weber: Siboga Exped., vol. 65, p. 213, 1913 (Atjatuning, west coast New Guinea).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 112, 1913 (Saonek, Waigiu).

Head 2 3/5; depth 3; D. XIII, 7, 1; A. III, 8, 1; scales 18 in upper section of lateral line, 7 in lower section to caudal base and 3 more on latter; 2 scales above lateral line, 6 below; 9 predorsal scales; snout 5 in head from upper jaw tip; eye 4 1/4; maxillary 2 1/8; interorbital 6 2/3. Least depth of caudal peduncle 2 1/6 in total head length; head width 1 2/3. Gill rakers IV, 1+6, II, lanceolate, robust, 1 1/2 in gill filaments, which 1 3/5 in eye. Scales with 12 to 17 basal radiating striae, sometimes 1 to 3 auxiliaries; sometimes 12 radiating striae apically but not to margin; apical denticles 81 to 89, nearly uniserial. Last dorsal spine 2 1/3 in total head; sixth ray 1 3/5; seventh anal ray 1 1/2; pectoral 1 2/5; ventral 1. Largely blackish-brown. Soft dorsal and anal with narrow white edge, fins dusky to blackish otherwise.

The Bishop Museum contains 3 from Shortland Island, 33 to 140 mm. (caudal broken). Two from Guam in 1923. A large series in the Agassiz Museum, 28 Kingsmills through Andrew Garrett, 5 Ebon Island through Rev. B. G. Snow in 1877, 4 Ponapé from Rev. L. H. Gulick and 40 Apia, Samoa. In the National Museum 2 labeled "Oahu" though likely from Fiji, 1 from Fiji obtained by the Wilkes Expedition.

The species *Plesiops oxycephala* from the East Indies appears to differ only in color.

Zanzibar to the East Indies, China, Australia to Fiji and Samoa.

PSEUDOCHROMIDAE

Nesiotes purpurascens De Vis.

Nesiotes purpurascens De Vis: Linn. Soc. New South Wales, Proc., vol. 8, p. 453, 1883 (type loc., South Sea).

Head 2 4/5; depth 2 4/5; D. II, 25 or 26; A. III, 14; scales 37 in lateral line; snout 4 in head; eye 3/4 [evidently of snout?]; interorbital 1/2 of orbit. Profile convex above, much less so beneath. Preorbital low. Canines 4/4, none posterior; laterals confluent, with distinct serration. Cheek scales in 4 rows, imbricate; on opercle few, large, not imbricate. Dorsal base not scaly. Dorsal and anal acuminate, last rays rather prolonged. Caudal bluntly pointed. Purplish-brown. Scales of body with conspicuous dark edges and obscure pale spots tending to form longitudinal lines. Pectoral and caudal bases pale, in latter space vertical ellipse of ground-color. Length 64 mm. (DeVis)

Dampieria hellmuthii (Bleeker).

Cichlops hellmuthii Bleeker: Nat. Tijds. Ned. Ind., vol. 6, p. 329, 1854 (type loc., Larantuka [Floris]).—Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).—Bleeker: Atlas ichth., vol. 9, pl. (1) 390, fig. 4, 1877.

Head 2 4/5; depth 2 4/5; D. II, 25 or 26; A. III, 14 or 15; scales 60 in median lateral series; snout 4 in head from snout tip; eye 3 3/4; maxillary 2 1/4, nearly reaches eye center; 6 rows of cheek scales. Brownish-red above, pale red below. Snout and cheek with many oblique blue lines and blue line around eye posteriorly. Predorsal and back above with numerous small blue dots. Edges of vertical fins blue; front of dorsal finely dotted blue and forming longitudinal parallel lines posteriorly. Anal with red and blue lines, many as spots, longitudinal. Paired fins red, without dark spot at pectoral base. Length 119 mm. (Bleeker)

East Indies.

Dampieria spiloptera (Bleeker).

Cichlops spilopterus Bleeker: Nat. Tijds. Ned. Ind., vol. 5, p. 168, 1853 (type loc., Macassar).—Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).—Bleeker: Atlas ichth., vol. 9, pl. (1) 390, fig. 9, 1877.

Head 3 2/5; depth 2 3/4; D. II, 25 or 26; A. III, 14 or 15; scales 60 in median lateral series; snout 3 4/5 in head from snout tip; eye 4; maxillary 2 1/6, reaches eye center; 7 rows of cheek scales. Violaceous-brown above, red below. Cheek with oblique blue lines and blue line around eye posteriorly. Vertical fins all edged blue, dorsal dotted with blue anteriorly, giving place to longitudinal lines posteriorly which often broken as dots, bars or blotches. Caudal and anal without spots or bands. Paired fins red, pectoral with dusky basal blotch above. Length 171 mm. (Bleeker)

East Indies.

Pseudochromis fuscus Mueller and Troschel.

Pseudochromis fuscus Mueller and Troschel: Horae ichth., vol. 3, p. 23, pl. 4, fig. 2, 1849 (type loc., Celebes).—Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., pt. 2, p. 299, 1868 (Waigiu).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 159, 1876 (Solomons; Pelew Islands; Yap).—Bleeker: Atlas ichth., vol. 9, pl. (5) 388, fig. 4, 1877.

Pseudochromis adustus Günther: Cruise of "Curacoa" (Brenchley), p. 407, 1873 (Solomons).

Head 3; depth 2 1/2; D. III, 26, 1; A. III, 13, 1; tubes 23 in lateral line to middle of soft dorsal and 11 in straight section to caudal base, with 1 more on latter; 4 scales above lateral line to spinous dorsal origin; 13 scales below upper section of lateral line; 20 predorsal scales; snout 3 4/5 in head measured from upper jaw tip; eye 4 1/4; maxillary 2 2/3; interorbital 4 2/3. Least depth of caudal peduncle 2 in its length. Second dorsal spine 3 2/5 in total head length; twenty-second dorsal ray 1 7/8; third anal spine 3 2/3; tenth anal ray 2; caudal 1 1/4; pectoral 1 1/3; ventral 1, spine 3. Length 70 to 90 mm.

Two in the Bishop Museum from Shortland Island.

Distinguished from *Dampieria spiloptera* by the duller coloration, a submarginal dusky band along hind caudal edge, pectoral base dark or dusky.

East Indies, Micronesia, Melanesia.

Pseudochromis polyacanthus Bleeker.

Pseudochromis polyacanthus Bleeker: Nat. Tijds. Ned. Ind., vol. 10, p. 375, 1856 (type loc., Ternate).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).—Kner: Akad. Wiss. Wien, Sitz., vol. 56, p. 717, 1867 (Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 16, 1869 (Viti Islands).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 159, pl. 98, fig. A, 1876 (Tahiti; Raiatea).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 523, 1900 (Tahiti).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 384, 1923 (Honolulu).

Pseudogramma polyacanthus Bleeker: Atlas ichth., vol. 9, pl. (1) 389, fig. 3, 1877.—Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 139, 1902 (1903) (Marcus Island).

Pseudograma polyacantha Fowler: B. P. Bishop Mus., Bull. 22, p. 37, 1925 (Tahiti).

Head 2 1/2 to 2 4/5; depth 3 1/2 to 3 3/4; D. VII, 19 to 22; A. III, 16 to 18; scales 30 to 33 in lateral line which ends below middle of soft dorsal; snout 4 1/8 to 4 2/3 in head from upper jaw tip; eye 3 7/8 to 4 2/3; maxiliary 2 to 3 1/5; interorbital 8 1/4, or 1 1/4 to 3 in eye. Least depth of caudal peduncle 3 in total head length. Head width 1 4/5 in its length. Maxillary extends beyond eye, expansion 1 1/8 to 1 1/4 in eye. Third dorsal spine 5 2/5 in total head; fifteenth dorsal ray 2 2/5; second anal spine 7 3/4; thirteenth anal ray 2 7/8; caudal 1 3/4; pectoral 1 1/2; ventral 2 3/4.

In the Bishop Museum 1 from Honolulu 65 mm. long and 1 from Marcus Island 50 mm. One in the Academy from Tahiti.

Readily known by the increased dorsal spines and dark spot on front of opercle above.

East Indies, Polynesia, Hawaii.

Pseudoplesiops typus Bleeker.

Pseudoplesiops typus Bleeker: Nat. Tijds. Ned. Ind., vol. 15, p. 217, 1858 (type loc., Goram Island).—Bleeker: Soc. Sci. Ind. Neerl., Act. no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).—Bleeker: Atlas ichth., vol. 9, pl. (5) 388, fig. 3, 1877.

Head 2 3/4; depth 3; D. XVI, 9 or 10; A. VII, 9; scales 36 in median lateral series; maxillary nearly reaches eye center; 4 rows of cheek scales. Uniform yellowish-rosy, paler below. Iris rosy-yellow. Length 46 mm. (without caudal). (Bleeker)

Differs from *Dampieria* or *Pseudochromis* in the absence of fin spines and the outer 2 ventral rays elongated to filiform.

East Indies.

PRIACANTHIDAE

Genus PRIACANTHUS Oken

COOKEOLUS new subgenus[1]

Type—*Anthias boops* Schneider.

Readily distinguished from *Priacanthus* by the greatly enlarged and conspicuous ventrals, at least as long as the head.

This group appears to have only a single species ranging through the South Atlantic and Indo-Pacific. It represents the extreme of development in the Priacanthids.

Priacanthus boops (Schneider) (Pl. XV, *C*).

Anthias boops Schneider: Systema ichth., Bloch, p. 308, 1801 (type loc., Atlantic Ocean near St. Helena) (on Forster).

Priacanthus boops Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 382, 1923 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 26, 1925 (Honolulu).

Priacanthus japonicus E. K. Jordan: U. S. Nat. Mus., Proc., vol. 66, p. 19, 1925 (Honolulu).

Head 2 4/5; depth 2 1/3; D. X, 15, 1; A. III, 14, 1; P. II, 16; V. I, 5; scales 84 in lateral line to caudal base and 3 more on latter; pores 62 in lateral line to caudal base and 2 more on latter; 17 scales above lateral line, 34 below; 66 predorsal scales; snout 3 2/5 in head measured from upper jaw tip; eye 2 2/3; maxillary 1 7/8; interorbital 4.

Upper profile of head slightly concave; head width 2 1/6 its total length. Snout obtuse, length 3/4 its width. Maxillary large, reaches pupil; expansion 1 4/5 in eye. Mandible strongly protrudes, symphysis with rugose pad; 1 4/5 in total head length. Teeth conic, strong, short, in narrow bands in jaws, on vomer and palatines. Nasal cavity very large, deep, vertical slit equal to pupil. Preopercle spine flat, rather broad, short. Gill rakers 6 + 18, lanceolate; gill filaments 2/3 of gill rakers, which 2 1/4 in eye. Scales all small and crowded towards dorsal edge of back, on head, breast and chest. Cheek with 15 rows of scales and 14 on maxillary expansion. Scales with apical denticles uniserial, marginal, about 30. Dorsal spines rather slender terminally, first 1/5 of last which 1 7/8 in total head; last anal spine 3; third branched dorsal ray 1; second anal ray 1 1/4; least depth of caudal peduncle 3 1/2; length of caudal fin 1 1/5, fin truncate, slightly convex when expanded; pectoral 1 2/3 in head; ventral nearly long as eye combined with head, spine 1 2/5 in head or about 3/5 of fin, reaches base of fifth anal ray.

In alcohol uniform pale brown, membranes of spinous dorsal rather broadly bordered blackish. Soft dorsal above tinged dusky. Soft anal like soft dorsal. Hind caudal edge pale dusky. Ventral membranes black.

The above described specimen in the Bishop Museum, 355 mm. long, obtained at Honolulu. Two others, about same size, were also reported by Thompson.

South Atlantic, Indian and West Pacific oceans.

Subgenus PRIACANTHUS Oken

In the subgenus *Priacanthus* the ventrals are moderate.

Priacanthus cruentatus (Lacépède).

Labrus cruentatus Lacépède: Hist. nat. Poiss., vol. 3, pp. 452, 522, 1800 (type loc., America [Martinique]).

Priacanthus cruentatus Boulenger: Cat. fishes Brit. Mus., vol. 1, p. 352, 1805 (Samoa; Tahiti; Ponapé).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 18, 1902 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 450, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 229, fig. 94, 1903 (1905) (Honolulu, Hilo, Napoopoo, Kailua).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 38, 1906 (Tahiti).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1378, 1906 (Savaii).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 261, 1905 (1906) (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 286, 1911 (Papeete, Tahiti).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 47, Dec. 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 26, 1925 (Honolulu).

Priacanthus carolinus Cuvier: Hist. nat. Poiss., vol. 3. p. 78, 1829 (type loc., Ualan Island, Carolines).—Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 224, 1830 (Caroline Islands).—Streets: U. S. Nat. Mus., Bull. no. 7, p. 72, 1877 (Honolulu).—Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 17, pl. 18, 1873 (Tahiti; Raiatea).—Sauvage: Hist. nat. Madagascar, Poiss., vol. 16, p. 121, 1891 (type; Honolulu).

The usual number of soft dorsal rays is 12. Gill rakers 11 to 1V, 2 to 5 + 17 to 19. Caudal variously truncate, especially in young, to slightly emarginate in the adult. In latter, when expanded, caudal often convex behind with upper and lower points slightly produced. Caudal variably dusky terminally, also dusky spots, which may or may not be present on the other vertical fins. Ventral variously dusky in smaller specimens, though pale in larger.

In the Bishop Museum 24 from Honolulu, largest 273 mm. Also 2 from Tahiti, 1 Nukuhiva, 1 Rarotonga. In the Honolulu markets I examined over 500 specimens from October to December, 1922. In the National Museum 4 Hawaiian, series from Honolulu obtained by T. H. Streets, 1 Papeete, 1 Apia. In the Agassiz Museum 10 Hawaiian of which 5 from Andrew Garrett and 3 from W. H. Jones, 1 Maui from C. F. Winslow, and 2 Society Islands from Andrew Garrett. One from Hawaiian islands in the Academy.

Circumtropical.

Priacanthus macracanthus Cuvier.

Priacanthus macracanthus Cuvier: Hist. nat. Poiss., vol. 3, p. 81, 1829 (type loc., Amboina).

Priacanthus meeki Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 450, fig. 20, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 231, fig. 95, 1903 (1905) (type; Honolulu; Hilo).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 47, Dec. 1922 (Hawaii).—Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., 4th series, vol. 14, no. 20, p. 663, pl. 23, fig. 1, 1927 (Honolulu).

Priacanthus helvolus Jordan, Evermann, Tanaka: op. cit., p. 664, pl. 23, fig. 2, 1927 (type loc., Honolulu).

The Bishop Museum has 4 from Honolulu. In the National Museum 4 obtained in the Hawaiian islands by the Wilkes Expedition, 1 labeled Maui? Also a Hawaiian specimen from the Bureau of Fisheries and the type of *Priacanthus meeki*.

Allied with *Priacanthus cruentatus* in the presence of 13 or 14 soft dorsal rays and 13 or 14

[1] For Dr. Charles Montague Cooke, in slight appreciation of his contributions to Pacific conchology.

anal. The dorsal rays constantly greater in my specimens. It differs, however, in the slightly more numerous gill rakers, II or III, 5 to 7 + 23 to 25. Jordan and Evermann compared the nominal *Priacanthus meeki* with *Priacanthus hamrur*. There is little doubt that their specimens, at least in part, represent the present species and are allied with *Priacanthus cruentatus*. Their comparison originally should have been made with *Priacanthus macracanthus*. Reaches 320 mm.

East Indies, Australia, Formosa, Japan, Hawaii.

Priacanthus hamrur (Forskål).

Sciaena hamrur Forskål: Descriptiones animalium, pp. 11, 45, 1775 (type loc., Djedda and Lohaja, Red Sea).

Priacanthus hamrur Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 235, 1882 (New Guinea).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 484, 1901 (Honolulu; Laysan).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 38, fig. 12, 1906 (Shortland Island, Solomons).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 14, 1925 (French Frigates Shoal).

Priacanthus alalaua Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 181, 1902 (1903) (type loc., Honolulu).—Snyder: op. cit., p. 527, 1902 (1904) (Honolulu; Laysan).—Jordan and Evermann: op. cit., vol. 23, no. 1, p. 228, fig. 93, 1903 (1905) (Honolulu).

Priacanthus ulalaua Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., 4th series, vol. 16, no. 20, p. 663, 1927 (Honolulu).

In the Bishop Museum 5 from Honolulu, largest 337 mm. In November and December 1922 I found 35 specimens in the Honolulu markets. Also 2 in the Bishop Museum from Shortland Island, and 3 from French Frigates Shoal which were obtained by the Tanager in 1923. In the National Museum 2 Hawaiian specimens, one the type of *Priacanthus alalaua*. In the Agassiz Museum 105 from Honolulu obtained by W. H. Jones in 1874, 2 small Hawaiian specimens from Andrew Garrett and 2 from Maui from C. F. Winslow.

Usually distinguished from *P. macracanthus* and *P. cruentatus* by the presence of 14 or 15 soft dorsal rays, crescentic caudal and most all fins dark or blackish, except pectoral. Body often rosy with dusky diffusion. *Priacanthus alalaua* is certainly a synonym, which was described without making comparison with *Priacanthus hamrur*. Reaches 360 mm.

Red Sea and Zanzibar to the East Indies, Japan, Hawaii.

PEMPHERIDAE

Leptobrama mülleri Steindachner.

Leptobrama mülleri Steindachner: Akad. Wiss. Wien, Sitz., vol. 78, pt. 1, p. 388, 1878 (1879) (type loc., Townsville, Clevelands Bay, Queensland).—Ogilby: Queensland Mus., Mem., vol. 2, p. 64, pls. 18-19, Dec. 10, 1913 (type of *Neopempheris pectoralis*).

Neopempheris pectoralis Ramsay and Ogilby: Linn. Soc. New South Wales, Proc., 2nd ser., vol. 2, p. 563, 1887 (1888) (type loc., about 30 miles up Aird River, New Guinea).

Head 4 1/3 to 4 1/2; depth 2 4/5 to 3 1/3; D. VI, 16 to 18; A. III, 26 to 30; scales 75 to 77, 10 to 12 above, 12 or 13 below; snout 4 1/2 to 5 1/6; eye 3 4/5 to 4 1/4; maxillary 1 1/5 to 1 3/5; interorbital 3 3/4 to 4 1/2. Gill rakers 3 or 5 + 6 or 7 and 1 or 2 rudiments above and below. Silvery, back steel-blue. Fins dusky, end of dorsal lobe black. Length 300 mm. (Ogilby)

Differs from *Pempheris otaitensis* in the elliptical body, lower preopercle edge serrulate and the long, narrow tubes in the lateral line.

Queensland and southern New Guinea.

Pempheris otaitensis Lesson.

Pempheris otaitensis Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 167, 1830 (type loc., Tahiti).—Cuvier: Hist. nat. Poiss., vol. 7, p. 226, pl. 191, 1831 (Tahiti).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 265, 1883 (Hood Bay, New Guinea).—Sauvage: Hist. Madagascar, Poiss., p. 286, 1891 (type).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 74, 1900 (1901) (Guam).

Pempheris oualensis Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 168, 1830 (type loc., Oualan).—Cuvier: Hist. nat. Poiss., vol. 7, p. 223, 1831 (Oualan).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1376, 1906 (Savaii; Upolu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 236, 1905 (1906) (Samoa).—Ogilby: Queensland Mus., Mem., vol. 2, p. 66, Dec. 10, 1913 (Carolines; New Guinea; South Sea Islands).

Pempheris mangula (non Valenciennes) Günther: Mus. Godeffroy, Jour., vol. 4, pt. 11, p. 102, pl. 59, fig. B, 1875 (Samoa; Vanicolo; Kingsmills; Carolines).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 32, 1906 (Tahiti).

Head 3 1/3; depth 2 1/4; D. VI, 9; A. III, 40; scales 82 in lateral line to caudal base and 22 more on latter; 9 scales above lateral line, 18 below; 64 predorsal scales; snout 4 2/5 in head measured from upper jaw tip; eye 2; maxillary 2; interorbital 3. Head width 1 7/8 in its total length; pectoral 1 1/4. Dark brown. Front edge of dorsal, hind edge of caudal, pectoral base and axil blackish or dusky. Lower or broad marginal part of anal, all of pectoral and ventral and median portion of caudal pale brown.

In the Bishop Museum one from Tahiti 202 mm. long and 4 from Guam. Four from Apia and 5 young from Samoa, received from C. H. White, in the National Museum. Two in the Agassiz Museum from the Society Islands.

East Indies, Micronesia, Polynesia.

Pempheris mangula Cuvier.

Pempheris mangula Cuvier: Regne animal, vol. 2, p. 195, 1829 (on *Mangula kutti* Russell, Fish. Coromandel, vol. 2, p. 10, pl. 114, 1803, type loc., Coromandel).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 14, 1877 (Huahine).

Pempheris vanicolensis Cuvier: Hist. nat. Poiss., vol. 7, p. 227, 1831 (type loc., Vanicolo).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 236, 1905 (1906) (Apia).—Ogilby: Queensland Mus., Mem., vol. 2, p. 66, Dec. 10, 1913 (Vanicolo; Samoa).

?Pempheris woodlarkensis Thiollière: Fauna Woodlark, p. 170, 1857 (type loc., Woodlark Island).

Differs from *P. otaitensis* in the absence of a dark external blotch at the pectoral base.

Three from Apia in the National Museum.

Pempheris woodlarkensis is too imperfectly noticed to permit identification. It is said to have a very large eye and the back more straight than in other species. Iris white. Back gray brown, flanks and abdomen covered with small reddish-brown dots. Length 75 mm.

East Africa, Mauritius, East Indies, Samoa.

LOBOTIDAE

Lobotes surinamensis (Bloch).

Holocentrus surinamensis Bloch: Nat. ausländischen Fische, vol. 4, pt. 7, p. 98, pl. 243, 1790 (type loc., Surinam).

Lobotes surinamensis Bleeker: Atlas ichth., vol. 8, p. 12, pl. (40) 318, fig. 1, 1876-77 (Waigiu).

[*Lobotes erate* Valenciennes: Règne Animal, Cuvier, Ill., Poiss., pl. 31, fig. 1, 1839 (Coromandel).]

Lobotes auctorum Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).

Widely distributed in the Western Atlantic, Madagascar, East Indies, and Japan.

LUTJANIDAE
ETELINAE

Apsilus zonatus (Valenciennes) (Pl. XVI, *A*).

Serranus zonatus Valenciennes: Hist. nat. Poiss., vol. 6, p. 383, 1830 (type loc., Mauritius).

Etelis zonatus Sauvage: Hist. nat. Madagascar, Poiss., p. 109, pl. 11, fig. 3, 1891 (type).

Apsilus zonatus Fowler: Copeia, no. 142, p. 39, May 20, 1925 (note on Hawaiian examples).—Fowler: B. P. Bishop Mus., Bull. 22, p. 26, 1925 (Honolulu).

Serranus brighami Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 4, p. 7, fig. 3, 1901 (type loc., Honolulu).

Apsilus brighami Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 452, 1902 (1903) (Honolulu).—Snyder: op. cit., p. 527, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, no. 1, p. 233, pl. 16, 1903 (1905) (Honolulu, Kailua).

Rooseveltia brighami Jordan and Snyder: (U. S.) Bur. Fish., Bull., vol. 26, p. 213, 1906 (1907) (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 48, Dec., 1922 (Hawaii).

Rooseveltia aloha Jordan and Snyder: U. S. Fish Comm., Bull., vol. 26, p. 212, fig. 3, 1906 (1907) (type loc., Honolulu).

Head 2 9/10; depth 2 5/6; D. X, 10, 1; A. III, 8, 1; scales 61 in lateral line to caudal base and 6 more on latter; 7 scales above lateral line, 16 below; 15 predorsal scales; snout 3 in head measured from upper jaw tip; eye 4; maxillary 2 2/5; interorbital 3 7/8. Least depth of caudal peduncle 3 1/8 in total head length. Head width 2 1/8 in its length. Snout length 7/8 its width. Maxillary reaches opposite eye center; expansion 2 1/2 in eye. Teeth in bands in jaws, on vomer and palatines; row of outer jaw teeth slightly enlarged. Preopercle edge denticulate. Gill rakers v to vii, 1 or 2 + 8 or 9, ii or iii, lanceolate, equal gill filaments or 2 1/3 in eye. Suprascapula obsoletely denticulate. Maxillary naked. Fifth dorsal spine 3 in head; last dorsal ray 2 1/5; third anal spine 4; last anal ray 2 1/4; caudal deeply forked, tips not produced, 1 1/4; pectoral 1 1/8; ventral 1 1/2. In alcohol faded uniform dull brownish.

In the Bishop Museum the type of *Serranus brighami*, 432 mm. and 2 other specimens from Honolulu, 393 and 450 mm. long. I also found the following in the Honolulu markets: 1 December 2, 1922, 1 December 9, 3 December 13, 2 December 30, 1 December 31, 1 January 1, 1923. In the National Museum 3 from Honolulu, including the type of *Rooseveltia aloha*.

Mauritius, Hawaii.

Pristipomoides typus Bleeker.

Pristipomoides typus Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 575, 1852 (type loc., Siboga, western Sumatra).

Chaetopterus pristipoma Bleeker: Kon. Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 3, p. 83, 1869 (New Guinea).

Aprion (Aprion) pristipoma Bleeker: Atlas ichth., vol. 8, p. 79, pl. (58) 336, fig. 3, 1867-77 (New Guinea).

Head 3 1/6 to 3 1/4; depth 3 1/6 to 3 1/4; D. X, 11 or 12; A. III, 8 or 9; scales 50, 6 above, 15 or 16 below, 14 predorsal to occiput; snout about equals eye, which 3 1/4 in head; maxillary to front pupil edge; interorbital 1 1/3 in eye; preopercle denticulate around angle. Cheek with 6 rows of scales. Rosy, head deep above. Iris yellow. Dorsals with basal, marginal and median longitudinal greenish yellow lines, more or less broken. Length 293 mm. (Bleeker)

Andaman Islands, East Indies.

Pristipomoides microlepis (Bleeker).

Chaetopterus microlepis Bleeker: Kon. Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 3, p. 80, 1869 (type loc., Amboina; Bourbon Island).

Aprion microlepis Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 502, 1900 (Hawaii).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).

Arnillo auricilla Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., 4th ser., vol. 16, no. 2, p. 668, pl. 23, fig. 3, 1927 (type loc., Honolulu).

Head 2 9/10; depth 3 3/5; D. X, 10, 1; A. III, 8; scales 62 in lateral line to caudal base and 3? more on latter, 9 above, 16 below, 18 predorsal extend forward to occiput; snout 3 1/3 in head from snout tip; eye 3 1/8; maxillary 2 2/5; interorbital 3 3/4.

Body elongate, rather slender and compressed. Least depth of caudal peduncle 1 4/5 its length or 3 3/4 in total head length. Head width 2 1/5 in its length. Snout convex over surface and in profile, long as wide. Eye large, greater than snout or interorbital, hind pupil edge midway in total head length. Mouth moderate, lower jaw protruding. Maxillary reaches opposite front pupil edge, expansion 2 3/4 in eye. Bands of conic teeth in jaws, firmly erect, comprising outer enlarged series and inner band of small ones of 3 irregular rows anteriorly in jaws; outer teeth anteriorly as 6 canines; no teeth on tongue; vomer with triangular patch of fine teeth and several enlarged at each outer angle; narrow band of small teeth on each palatine. Nostrils near together, posterior about half pupil length before front of eye. Interorbital nearly level. Least width of suborbital 3/4 of pupil. Preopercle edge denticulate, denticles largest around angle. Gill rakers 8 + 18, lanceolate, longer than gill filaments or 2 in eye. Pseudobranchiae large as gill filaments. Suprascapula serrated.

Scales in even longitudinal rows parallel with lateral line. Cheek with 6 rows of scales. Caudal largely covered with fine scales, though now mostly fallen from rays, and other fins scaleless. Scales with 7 to 9 basal radiating striae, edge scalloped; apical denticles 49 to 52, with imperfect row of basal elements; circuli fine. Third dorsal spine 2 1/3 in total head length; second dorsal ray 3 2/3, last 3; third anal spine 3 2/3, first ray 3 1/4; caudal 1 1/5, deeply forked, lobes sharply pointed; pectoral 1 1/2 (tips damaged); ventral 1 3/4.

Body faded uniform brownish, with slight olive cast

above, below and on sides lighter or with silvery tints. Eye pale. Fins all pale brownish. Length 152 mm.

One in the Academy from the Hawaiian islands, received from J. K. Townsend. A comparison with Bleeker's description (Atlas ichth., vol. 8, p. 78, 1876-77 Amboina) and figure (op. cit., pl. 338 [58], fig. 5) shows that it is certainly the same. I therefore protest Jordan and Evermann's attempt to identify it with *Apsilus microdon*! It is easily known from *Aphareus,* with which it agrees in the continuous dorsals, by the enlarged teeth and longer pectoral, etc. The Japanese *Pristipomoides sparus* (Schlegel) differs in the larger scales, 50 in the lateral line.

From Bourbon and Amboina to Hawaii.

Pristipomoides sieboldii (Bleeker) (Pl. XVI, *B*).

Chaetopterus sieboldii Bleeker: Bataviaasch Genoot., Verh. (Nalez. Ichth. Jap.), vol. 26, p. 20, 1857 (on *Chaetopterus* Schlegel, Fauna Japonica, Poiss., pts. 5-6, p. 78, pl. 37, fig. 2, 1844, type loc., Japan).

Pristipomoides sieboldii Jordan and Richardson: U. S. Nat. Mus., Proc., vol. 39, p. 462, fig. 6, 1911 (type of *Bowersia ulaula*).—Fowler: B. P. Bishop Mus., Bull. 22, p. 26, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 14, 1925 (Johnston Island).

Ulaula sieboldi Jordan and Jordan: Carnegie Mus., Mem., no. 1, p. 49, Dec., 1922 (Hawaii).

Aprion microdon Steindachner: Akad. Wiss. Wien, Sitz., vol. 74, pt. 1, p. 206, 1876 (1877) (type loc., Hawaiian islands).

Apsilus microdon Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 451, 1902 (1903) (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 234, 1903 (1905) (Honolulu, Hilo, Kailua).

Platyinius microdon Snyder: U. S. Fish Comm., Bull., vol. 22, p. 527, 1902 (1904) (Honolulu).

Bowersia ulaula Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 183, 1902 (1903) (type loc., Hilo, Hawaii).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 237, fig. 98, 1903 (1905) (type).

Bowersia violescens Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 183, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 236, fig. 97, 1903 (1905) (Honolulu).—Jordan and Snyder: (U. S.) Bur. Fish., Bull., vol. 26, p. 213, 1906 (1907) (Honolulu).

Chaetopterus dubius Jordan and Snyder: U. S. Fish Comm., vol. 26, p. 213, 1906 (1907) (Honolulu).

Head 2 7/8 to 3 1/3; depth 3 1/3; D. X, 11, 1; A. III, 7, 1 or 8, 1; scales in lateral line 58 to 67 to caudal base and 4 to 6 more on latter; 8 scales above lateral line, 12 to 15 below; 16 or 17 predorsal scales; snout 3 1/6 to 3 1/5 in head measured from upper jaw tip; eye 3 1/5 to 4 1/3; maxillary 2 1/2; interorbital 2 3/4 to 3 4/5. Least depth of caudal peduncle 3 1/3 to 3 2/3 in total head length. Head width 2 to 2 1/10 in its length. Snout obtuse, conic, length 4/5 to 1 in its width. Maxillary reaches pupil; expansion 1 4/5 to 2 3/4 in eye. Gill rakers 7 + 16, lanceolate, equal gill filaments or 2 7/8 in eye. Suprascapular edge sharp, uneven but not denticulate. Maxillary naked. Fourth dorsal spine 2 1/2 to 2 2/3 in head; last dorsal ray 2 1/2 to 2 2/3; third anal spine 3 2/3; last anal ray 2 2/5 to 3 3/5; caudal 1 1/8 to 1 1/4; pectoral 1 to 1 1/4; ventral 1 2/5 to 1 1/2. Dusky, with mottled appearance due to darker scale bases, some of which appear spotted. Caudal soiled to dusky, other fins paler. Iris dull greenish. Length 576 mm.

Seven in the Bishop Museum from Honolulu. In the Honolulu markets during November and December 1922 and in January 1923 I examined 1164 specimens of all ages. One obtained by the Tanager at Johnston Island in 1923. Four Hawaiian specimens in the National Museum, including the types of *Bowersia ulaula* and *Bowersia violescens*.

Southern Japan, Hawaii.

Aprion virescens Valenciennes (Pl. XVI, *C*).

Aprion virescens Valenciennes: Hist. nat. Poiss., vol. 6, p. 409, pl. 168, 1830 (type loc., Seychelles).—Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 16, 1873 (Society Islands; Hawaiian islands).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 484, 1901 (Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 16, 19, 1902 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 452, 1902 (1903) (Honolulu).—Snyder: op. cit., p. 527, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, no. 1, p. 239, fig. 99, 1903 (1905) (Honolulu, Hilo, Kailua).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 49, Dec., 1922 (Hawaii).

Sparopsis latifrons Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, p. 27, 1868 (type loc., Kandavu, Fiji).

Sparopsis elongatus Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, p. 303, pl. 3, fig. 6, 1868 (same type as *Sparopsis latifrons*).

Head 3 2/5; depth 4 1/4; D. X, 11, 1; A. III, 8, 1; scales 49 in lateral line to caudal base and 5 more on latter; 7 scales above lateral line, 14 below; 12 predorsal scales; snout 2 1/4 in head measured from upper jaw tip; eye 6; maxillary 2 1/4; interorbital 2 5/6. Least depth of caudal peduncle 3 7/8 in total head length. Head width 2 1/5 in its length. Snout elongate, width 1 1/4 its length. Maxillary almost reaches eye, expansion 1 1/2 in eye. Interorbital elevated convexly, rather widely depressed. Cheek with 6 rows of scales. Fifth dorsal spine 3 2/5 in head; last dorsal ray 2 3/5; third anal spine 4 1/6; last anal ray 2 3/5; upper caudal lobe 1 1/4?; pectoral 2 1/4; ventral 1 3/4. Brown, base of each scale dusky, contrasted as little dark triangular spots. Dorsals dusky, with membranes between last few spines blackish basally. Anal pale brown, little dusky terminally on membranes. Ventral membranes dusky, rays pale. Pectoral pale brownish.

In the Bishop Museum 7 from Honolulu, largest 655 mm. I examined 935 specimens in the Honolulu markets in November and December 1922 and January 1923. Two in the National Museum from Honolulu. Two in the Agassiz Museum from the Hawaiian islands. One in the Academy from Hawaiian islands.

Easily distinguished by the short pectoral, half the length of the head. In the following 2 species the pectoral equals or exceeds length of the head.

Seychelles to the East Indies and Hawaii. Reaches 720 mm.

Etelis carbunculus Cuvier (Pl. XVII, *A*).

Etelis carbunculus Cuvier: Hist. nat. Poiss., vol. 2, p. 94, pl. 18, 1828 (type loc., Mahé, Seychelles).—Jordan and Thompson: U. S. Nat. Mus., Proc., vol. 39, p. 465, 1911 (types of *Etelis evurus*).—Fowler: B. P. Bishop Mus., Bull. 22, p. 26, 1925 (Honolulu).

Etelis evurus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 184, 1902 (1903) (type loc., Hilo, Hawaiian islands).—Snyder: op. cit., p. 527, 1902

(1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, p. 242, pl. 38, 1903 (1905) (Hilo; Honolulu).—Jordan and Snyder: (U. S.) Bur. Fish., Bull., vol. 26, p. 213, 1906 (1907) (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 50, Dec. 1922 (Hawaii).

Head 2 7/8 to 3 1/6; depth 3 to 3 2/5; D. X, 11, 1; A. III, 8, 1; scales 47 or 48 in lateral line to caudal base and 7 and 8 more on latter; 6 or 7 scales above lateral line to spinous dorsal origin, 12 or 13 below to spinous anal origin; 23 predorsal scales, 15 to head; snout 3 1/4 to 3 1/3 in head measured from upper jaw tip; eye 3 1/3 to 4 3/5; maxillary 2 1/5 to 2 2/5; interorbital 3 1/4 to 3 3/5.

Body elongately ovoid, deepest at ventral origin edges all convex. Caudal peduncle compressed, least depth half its length or 3 1/8 to 3 1/2 in total head length. Head compressed, sides flattened and slightly constricted below; upper profile little more inclined, lower rather evenly convex; width 2 to 2 1/5 in its length. Snout conic, profile slightly concave or with slight depressions before nostril; length 4/5 its width. Eye large, elevated, hind edge midway in head without mandible. Mouth moderate, little inclined from horizontal; mandible well protruding, with slight symphyseal knob. Maxillary slips below preorbital its whole length, reaches first third to center of eye; expansion 2 to 2 2/3 in eye. Rather narrow to broad bands of villiform teeth in jaws, on vomer and palatines; in jaws outer series of well-spaced simple conic enlarged teeth, these all larger forward. Tongue broadly depressed, smooth, front edge free. Nostrils simple, circular, close together, internasal septum at last fourth in snout; front one with round fleshy posterior flap, large as hind nostril. Interorbital broadly convex. Preorbital width moderate, 1 3/4 in eye. Preopercle edge finely denticulate, entire with age.

Gill opening forward to front nostril. Gill rakers IV to 9+10, III to 14, lanceolate, 1 1/2 in gill filaments, which 1 1/4 in eye. Pseudobranchiae well developed, 3/5 of gill filaments. Isthmus narrow, constricted, slender, trenchant, with short median groove in front.

Scales large, moderately imbricated, in series parallel with lateral line. Head largely scaly, muzzle, flange of preopercle, maxillary and front of interorbital naked. Cheek with 10 rows of scales to preopercle ridge. Spinous dorsal depressible within sheath formed of scales along each side of base on back. Soft dorsal scaleless. Anal with basal border of low, very narrowly imbricate and rather small scales. Caudal largely scaly, scales out on fin becoming very small. Bases of pectoral and ventral with very fine scales. Scales with 6 to 9 basal radiating striae, 4 to 8 incomplete auxilaries; apical denticles 128 to 130, with age 224 to 240, weak, basal elements in 6 to 20 or more series, many of innermost irregularly obliterated; circuli fine.

Spinous dorsal begins opposite hind preopercle edge, second and third spines subequally longest, membrane edge entire, first spine 1 1/2 in last; third spine 2 to 2 1/2 in total head length. Soft dorsal inserted midway between hind eye edge and caudal base, third to fifth rays subequally longest, edge of fin rounded, last ray 1 1/5 in first; third ray 3 1/8 to 4 in head. Anal origin about opposite base of fourth dorsal ray, spines graduated to third which longest or 2 in first ray; third spine 4 1/5 to 5 1/2 in head. First and second anal rays subequally longest, not depressible far as tips of last ray, which 1 3/4 in first ray; first ray 2 9/10 to 3 in head. Caudal elongate, strongly emarginate behind, cleft slightly greater than length of median rays, upper pointed lobe little longer than lower, equal or slightly longer than head. Pectoral moderate, 1 2/3 to anal, rather wide and with hind edge slightly sigmoid, 1 1/8 to 1 4/5 in head. Ventral reaches 1 2/5 to anal, spine 2/3 of fin, 1 1/2 to 1 7/8 in head. Vent close before anal.

In alcohol rather dull uniform brown. Edges of all fins, at least membranes narrowly dusky, nearly blackish on dorsals. Iris pale brownish.

In the Bishop Museum 3 specimens from Honolulu, 381 to 1018 mm. In the National Museum type of *Etelis evurus*, 1 from Honolulu and 1 from Hilo. I examined 479 specimens in the Honolulu market in November and December 1922 and January 1923.

Possibly the reference to *Labrum anthiam* Lichtenstein (Descriptiones animalium; p. 155, 1844) from the tropical Pacific, may pertain to this species.

Tropical Atlantic, Mauritius, East Indies, Japan, Hawaii.

Etelis marshi (Jenkins) (Pl. XVII, *B*).

Eteliscus marshi Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 452, fig. 21, 1907 (1908) (type loc., Honolulu).

Etelis marshi Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 240, fig. 100, pl. 17, 1903 (1905) (Honolulu, Hilo, Kailua).—Fowler: B. P. Bishop Mus., Bull. 22, p. 26, 1925 (Honolulu).

Etelinus marshi Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 49, Dec., 1922 (Hawaii).

Head 2 7/8 to 3 1/8; depth 3 1/5 to 3 1/3; D. X, 11, 1; A. III, 8, 1; scales 48 or 49 in lateral line to caudal base and 5 to 8 more on latter; 6 scales above lateral line, 11 or 12 below; 15 to 18 predorsal scales; snout 3 1/10 to 3 2/5 in head measured from upper jaw; eye 4 1/2 to 4 2/3; maxillary 2 1/10 to 2 2/5; interorbital 3 to 3 1/4. Least depth of caudal peduncle 3 to 3 1/10 in total head length. Head width 2 to 2 1/10 in its length. Snout conic, width greater or equals length. Maxillary reaches eye center; expansion 2 to 2 1/2 in eye. Bands of strong conic teeth in jaws, outer row slightly enlarged, strong; bands of strong small teeth on vomer and palatines. Infraorbital width 1 2/5 to 1 1/2 in eye. Gill rakers III to V, 3 or 4+7 to 9, III or IV, lanceolate, equal gill filaments or 1 2/3 to 2 1/4 in eye. Third dorsal spine 2 1/8 to 3 in head; second dorsal ray 3 to 5 1/3; third anal spine 4 1/3 to 4 7/8; first branched anal ray 3 to 3 1/6; caudal length 1 1/4 to 1 2/5; pectoral 1 1/4 to 1 1/3; ventral 1 1/2 to 2. Brownish. Each scale on back with several dusky dots, with mottled appearance. Hind caudal edge pale, fins otherwise all pale.

Four in the Bishop Museum from Honolulu, largest 585 mm. I examined 782 in the Honolulu markets during November and December, 1922, and January, 1923. In the National Museum 1 from Honolulu and the type of *Eteliscus marshi*.

Etelinus (Jordan) Jordan and Thompson (U. S. Nat. Mus., Proc., vol. 39, p. 465, 1911) may stand as a distinct subgenus for this species. These writers have given "the less elongate form and the simply lunate caudal fin" as their characters. The reduced gill rakers 3 or 4+7 or 8 and greatly larger eye of the adults are better means of distinction.

Aphareus furcatus (Lacépède).

Labrus furca (Commerson) Lacépède: Hist. nat. Poiss., vol. 3, pp. 429, 477, pl. 21, fig. 1, 1802 (type loc., "the Great Ocean").

Aphareus furcatus Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 17, 1873 (Society Islands).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 12, 1877 (Raiatea; Pelew Islands).—Streets: U. S. Nat. Mus., Bull. no 7, p. 90, 1877 (Fanning Islands).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 451, 1902 (1903) (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 51, December 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 26, 1925 (Honolulu).—Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., 4th series, vol. 16, no. 2, p. 672, 1927 (Honolulu).

Aphareus flavivultus Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 390, fig. 1, 1899 (1901) (type loc., Honolulu).—Jenkins: op. cit., vol. 22, p. 451, 1902 (1903) (Kona, Hawaii).—Snyder: op. cit., vol. 22, p. 527, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 235, 1903 (1905) (Honolulu, Kailua, Hilo).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 611, 1908 (Honolulu).

Aphareus (*Sacrestinus*) *flavivultus* Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., 4th series, vol. 16, no. 2, p. 671, 1927 (Honolulu).

The Bishop Museum contains 9 specimens from Honolulu, largest 705 mm. I found 26 specimens in the Honolulu markets during November and December 1922 and in January 1923. Three of the Bishop Museum specimens have the pale frontal band, indicative of *Aphareus flavivultus* Jenkins, but seem in no other way to differ. Another has a very deep body, depth 2 4/5, and is of the *Aphareus flavivultus* type. The gill rakers of all are II to V, 4 to 6 + 16 to 18. In the National Museum an adult from the Fanning Islands obtained by T. H. Streets, 4 Hawaiian specimens and the type of *Aphareus flavivultus*. The Agassiz Museum has a specimen from the Society Islands, its gill rakers II, 4+17, length 355 mm.

Aphareus rutilans (Cuvier) (fig. 45).

Aphareus rutilans Cuvier: Hist. nat. Poiss., vol. 6, p. 369, 1830 (type loc., Red Sea).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 19, 1885 (Rubi, New Guinea).

Aphareus (*Fares*) *rutilans* Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., 4th series, vol. 16, no. 2, p. 673, pl. 24, fig. 1, 1927 (Honolulu).

Aphareus thompsoni Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 382, 1923 (type loc., Honolulu).

Distinguished from *Aphareus furcatus* by the greatly increased gill rakers 18+34.

Red Sea, Hawaii.

LUTJANINAE

The species *Diacope labuan* Thiollière (Fauna Woodlark, p. 146, 1857, type loc., Woodlark Island) is simply noticed as back black, flanks red, under surface white. It is unrecognizable.

Lutjanus kasmira (Forskål).

Sciaena kasmira Forskål: Descriptiones animalium, pp. 11, 46, 1775 (type loc., Arabia).

Lutianus kasmira Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 261, 1905 (1906) (Pago Pago).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 286, 1911 (Suva, Fiji).

Lutjanus kasmira Fowler: B. P. Bishop Mus., Bull. 22, p. 9, 1925 (Guam).

Diacope octolineata Cuvier: Hist. nat. Poiss., vol. 2, p. 315, 1828 (type loc., Tahiti; Mauritius; Red Sea; Pacific Ocean).

Mesoprion octolineatus Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, pp. 3, 4, 1850 (Doreh, New Guinea).

Perca polyzonia (Forster) Cuvier: Hist. nat. Poiss., vol. 2, p. 317, 1828 (name in text).

Perca polyzonias Lichtenstein: Descriptiones animalium, p. 225, 1844 (St. Christian, Wataho).

Diacope notata Cuvier: Hist. nat. Poiss., vol. 2, p. 318, 1828 (on Russel, Commerson and Peron).

Genyoroge notata Schmeltz: Mus. Godeffroy, Cat. 4, p. 13, 1869 (Upolu).

Mesoprion etaape Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 229, 1830 (type loc., Matavai Harbor, Tahiti; Beula Bay, Borabora).

Perca vittata (Parkinson) Valenciennes: Hist. nat. Poiss., vol. 6, p. 396, 1830 (name in text) (type loc., Tahiti).

Diacope decemlineata Valenciennes: Hist. nat. Poiss., vol. 6, p. 397, 1830 (type loc., New Guinea; Trinquemale, Ceylon).

Genyoroge bengalensis Schmeltz: Mus. Godeffroy, Cat. 4, p. 13, 1869 (Upolu).

Mesoprion bengalensis Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 12, 1873 (Society Islands).—Günther: Rept. voyage "Challenger," vol. 1, p. 34, 1880 (Kandavu, Fiji).

Lutjanus bengalensis Bleeker: Atlas ichth., vol. 8, p. 55, pls. (24) 302, (55) 333, fig. 4, 1876-77 (Waigiu).—Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).—Pellegrin: Mus. Paris, Bull., vol. 18, p. 206, 1912 (Port Sandwich, New Hebrides).

Lutianus bengalensis Peters: Akad. Wiss. Berlin, Monatsb., p. 831, 1876 (1877) (Cartaret Harbor, New Ireland).—Waite: Australian Mus., Mem., no. 3, p. 183, 1897 (Funafuti, Ellice Islands).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 78, 1900 (1901)

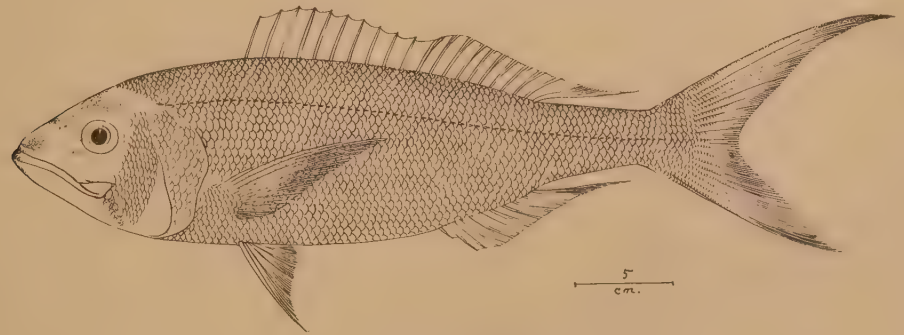

FIGURE 45.—Drawing of *Aphareus rutilans*.

(Guam).—Bryan and Herre: op. cit., Occ. Papers, vol. 2, no. 1, p. 130, 1902 (1903) (Marcus Island).—Seale: op. cit., vol. 6, no. 1, p. 44, 1906 (Faté; Nukuhiva; Tahiti).

Lutjanus quinquelineatus Bleeker: Atlas ichth., vol. 8, p. 56, pl. (65) 343, fig. 5, 1876-77 (southeast New Guinea).

Lutianus quinquelineatus Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 130, 1902 (1903) (Marcus Island).

Mesoprion quinquelineatus Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 232, 1882 (New Guinea).

Two in the National Museum from New Guinea, 165 and 168 mm. long. Both agree with Day's figure of *Lutianus quinquelineatus* (Fishes of India, pt. 1, pl. 12, fig. 3, 1875). One from Fiji obtained by the Wilkes Expedition. Others are 5 adults from Magdalene in the Marquesas from Captain Herndon, 1 Fiji, 2 Apia, 3 Tahiti from W. H. Jones in June 1883, 1 Tempe in the Marquesas also from W. H. Jones in 1883. The Bishop Museum has 6 from Nukuhiva, 2 Tahiti, 1 Mangareva, 3 Marcus Island and 1 Agaña on Guam. Also 5 from Guam in 1923. Largest 288 mm. The Agassiz Museum contains 12 from Apiang in the Gilbert Islands from Andrew Garrett, 1 Society Islands, 2 Ebon Island, 5 from Meos Boendi, Wiak Island, New Guinea through Thomas Barbour.

Red Sea, Zanzibar, Mozambique, Mauritius, East Indies, Melanesia, Micronesia, Polynesia.

Lutjanus aureovittatus (Macleay).

Mesoprion aureovittatus Macleay: Linn. Soc. New South Wales, Proc., vol. 4, p. 61, 1879 (type loc., Solomon Islands).

Lutianus aureovittatus Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 611, 1908 (Suva, Fiji).

Head little over 4 in total; depth 4; D. X, 12; A. III, 8; scales 45 in lateral line; eye equals snout, rather less than diameter apart; maxillary nearly reaches opposite eye center; preopercle serrated, gashed. Cheek with small scales. Dark bluish above lateral line, below silvery, with 3 golden longitudinal stripes. Large black blotch on lateral line opposite eighth dorsal spine to sixth dorsal ray. Fins yellowish. Dark bar across caudal near apex on lower lobe. Length 203 mm. (Macleay)

A nominal species suggestive of *Lutjanus kasmira*. Jordan and Dickerson give the dorsal rays 13, scales 50 and 4 yellow stripes below lateral line.

Lutjanus rufolineatus (Valenciennes).

Diacope rufolineata Valenciennes: Hist. nat. Poiss., vol. 6, p. 399, 1830 (type loc., New Guinea).

Diacope vitianus Hombron and Jacquinot: Voyage "Astrolabe" et "Zelee," Zool., vol. 3, p. 37, pl. 2, fig. 2, 1853 (type loc., Viti, Polynesia).

Mesoprion amboinensis Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).

Lutjanus amboinensis Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).—Bleeker: Atlas ichth., vol. 8, p. 57, pl. (40) 318, fig. 2, 1876-77 (Waigiu; Doreh).

Head 2 4/5 to 3; depth 2 3/5 to 2 3/4; D. X or XI, 14 or 15; A. III, 7 to 9; scales 65 along above lateral line, 53 along below lateral line, 7 or 8 above, 17 or 18 below, 12 or 13 predorsal to occiput; eye 1 1/3 in snout, 3 to 3 1/3 in head, 2/3 to 3/5 distant; maxillary nearly reaches opposite eye center; preopercle edge denticulate, with deep gash. Cheek with 8 rows of scales. Rosy, below whitish. Iris rosy. Numerous longitudinal yellowish-red streaks, oblique above lateral line, horizontal below. Black blotch below last dorsal spines on lateral line, often obsolete. Fins rosy to yellowish. Length 220 mm. (Bleeker)

East Indies, Melanesia, Polynesia.

Lutjanus johnii (Bloch).

Anthias johnii Bloch: Nat. ausländischen Fische, pt. 6, p. 113, pl. 318, 1792 (type loc., Suratta).

Mesoprion johnii Günther: Cat. fishes Brit. Mus., vol. 1, p. 200, 1859 (Pacific).—Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 15, 1873 (Tahiti).

Lutjanus johni Bleeker: Atlas ichth., vol. 8, p. 49, pl. (60) 338, fig. 3, 1876-77 (Waigiu).

Lutianus johnii Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 287, 1911 (Suva, Fiji; Moen, Truk Group, Carolines).

Lutjanus unimaculatus Quoy and Gaimard: Voyage "Uranie," Zool., p. 304, 1824 (type loc., Rawak; Waigiu).

Mesoprion unimaculatus Quoy and Gaimard: Voyage "Astrolabe," Zool., vol. 3, p. 665, pl. 5, fig. 3, 1834 (Port Dorey, New Guinea).

A well marked species, with scales above lateral line in parallel series with its course. Golden, with black lateral blotch below front of soft dorsal.

In the Agassiz Museum 1 Moen, 8 Society Islands, and 32 Apiang in the Gilbert Islands, both obtained by Andrew Garrett. Largest 305 mm.

East Africa, India, East Indies, China, Queensland, Melanesia, Micronesia, Polynesia.

Lutjanus chrysotaenia (Bleeker).

Mesoprion chrysotaenia Bleeker: Nat. Tijds. Ned. Ind., vol. 2, p. 170, 1851 (type Batavia).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 232, 1882 (New Guinea).

Head 2 3/5 to 3; depth 2 3/5 to 3; D. X, 15 or 16; A. III, 9 or 10; scales 80 along lateral line above, 70 along lateral line below, 10 or 11 above, 23 to 25 below, 17 predorsal to occiput; eye 1 1/2 in snout, 3 1/2 to 4 1/4 in head, 2/5 to 1 in interorbital; maxillary reaches middle of eye; hind preopercle edge finely denticulate, with gash. Cheek with 9 or 10 rows of scales. Above dilute blue, below pearl-blue. Head and body with 6 to 8 longitudinal golden-brown bands, golden to yellow with age. Fins golden or yellow, also iris. Pectoral base with transverse dark bar above. Length 305 mm. (Bleeker)

Nicobars, East Indies.

Lutjanus carponotatus (Richardson).

Mesoprion carponotatus Richardson: Ann. Mag. Nat. Hist. London, vol. 9, p. 28, 1842 (type loc., Port Essington, Australia).

Mesoprion carponotus Schmeltz: Mus. Godeffroy, Cat. 4, p. 13, 1869 (Kandavu, Fiji).

Head 3 2/3 in total; depth 3 2/3; D. X, 15; A. III, 10; scales 68 in lateral line; eye 4 1/3 in head; preopercle with few scarcely visible denticulations, slightly emarginate; opercle rounded; suprascapula entire. Fourth dorsal spine longest; second and third anal spines nearly equal; caudal truncate. Uniform, with black spot at pectoral root. (Günther)

Lutjanus vitta (Quoy and Gaimard).

Serranus vitta Quoy and Gaimard: Voyage "Uranie," Zool., p. 315, pl. 58, fig. 3, 1824 (type loc., Waigiu).—Valenciennes: Hist. nat. Poiss., vol. 2, p. 178, 1828

(Waigiu).—Valenciennes: op. cit., vol. 6, p. 380, 1830 (Vanicolo).

Mesoprion vitta Günther: Cat. fishes Brit. Mus. vol. 1, p. 207, 1859 (Louisiades).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 232, 1882 (New Guinea).

Mesaprion vitta Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 255, 1883 (Hood Bay, New Guinea).

Lutjanus vitta Bleeker: Atlas ichth., vol. 8, p. 51, pl. (62) 340, fig. 5, 1876-77 (Waigiu, New Guinea).

Head 2 4/5 to 3; depth 2 3/5 to 3; D. X, 13 or 14; A. III, 8 or 9; scales 65 to 70 along above lateral line, 59 or 60 along below lateral line, 6 or 7 above, 15 or 16 below, 14 predorsal to occiput; eye 1 1/5 in snout, 3 to 3 1/2 in head, 3/5 to 3/4 distant; maxillary reaches opposite eye center; preopercle edge finely serrate, without gash. Cheek with 6 or 7 rows of scales. Rosy, below whitish. Iris yellow, tinged red. Body with many longitudinal dusky lines, above lateral line oblique, below horizontal. Broad golden band from snout to eye and caudal base, expanded as dark blotch below front of soft dorsal. Fins yellow. Length 262 mm. (Bleeker)

Seychelles, India, East Indies, Queensland, China, Japan, Melanesia, Polynesia.

Jouan reports it from Kanala, New Caledonia, as *Diacope* No. 53 (Soc. Cherbourg, Mem., vol. 8, p. 274, 1861): D. X, 12; A. III, 6. Lower hind preopercle edge gashed, with bony tubercle. Tail forked. Red on back and flanks, orange below tinged with rose and carmine streaks on cheeks. Dorsal and caudal same color, other fins orange yellow. Length 120 mm. Possibly his *Holocentrum* No. 70 from the same locality (op. cit., p. 287) is also this species:

D. XII, 11. Silvery, sombre on back. Blackish transverse streaks between head and dorsal, bent longitudinal on tail. Length 200 mm.

Jouan evidently describes this as *Diacope* No. 54 from New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 275, 1861) from about the reefs: D. XI, 14; A. III, 8. Back and sides deep red, below rose-white. Golden band along middle of side from head to caudal. Dorsal and caudal red, paired fins and anal rosy. Iris golden. Length 300 mm. Also his next description, *Diacope* No. 55 from the reefs of Baie du Sud (op. cit., p. 276): D. X, 14; A. III, 8. Red on back, rose below. Longitudinal green band, with gold reflections, from eye to anal. Longitudinal black lines on flanks. Fins golden. Length 300 mm.

Lutjanus lutjanus Bloch.

Lutjanus lutjanus Bloch: Nat. ausländischen Fische, pt. 4, p. 107, 1790 (type loc., Japan).—Bleeker: Atlas ichth., vol. 8, p. 52, pl. (36) 314, fig. 3, 1876-77 (Waigiu?).

Lutianus lutianus Bloch: Nat. ausländischen Fische, pt. 4, pl. 245, 1790.

Mesoprion olivaceus Cuvier: Hist. nat. Poiss., vol. 2, p. 362, 1828 (type loc., Waigiu).

Mesoprion madras Schmeltz: Mus. Godeffroy, Cat. 4, p. 13, 1869 (Pelew Islands).

Head 2 3/4 to 3; depth 2 3/4 to 3; D. X, 13 to 15; A. III, 8 or 9; scales 65 to 67 along lateral line above, 52 along lateral line below, 5 or 6 above, 14 or 15 below, 12 predorsal to occiput; eye long as snout, 3 to 3 1/2 in head, 2/3 to 3/5 diameter distant; maxillary reaches opposite middle of eye; preopercle edge denticulate behind, entire below, without gash. Cheek with 6 rows of scales. Rosy above, silvery-white below. Iris yellow. Body with many longitudinal golden-brown lines, above lateral line oblique, below horizontal. Anal in front, pectoral below and all ventral whitish. Length 210 mm. (Bleeker)

Seychelles, India, East Indies, Japan, Micronesia.

Lutjanus erythropterus Bloch.

Lutianus erythropterus Bloch: Nat. ausländischen Fische, vol. 4, p. 115, pl. 249, 1790 (type loc., Japan).

Lutjanus chirtah Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).

Mesoprion annularis Günther: Rept. voyage "Challenger," vol. 1, p. 38, 1880 (Arafura Sea in S. Lat. 9° 36′ E. Long. 137° 56′).

Head 3; depth 3; D. XI, 11 to 13; A. III, 8 or 9; scales 63 along lateral line above, 48 to 50 along lateral line below, 4 or 5 above, 13 or 14 below, 12 predorsal to occiput; eye greater than snout, 3 in head from snout tip, 2/3 diameter distant; maxillary reaches middle of eye; preopercle edge finely denticulate, with gash. Cheek with 6 rows of scales. Rosy, below yellowish or rosy white. Iris yellow. Above lateral line many oblique yellow lines, below 5 to 9 horizontal, one from eye to caudal base medially much broader. Fins yellow, ventrals often with rosy. Length 202 mm. (Bleeker)

Red Sea, Zanzibar, India, East Indies, Melanesia.

Lutjanus adetii (Castelnau).

Diacopus adetii Castelnau: Zool. Acclimat. Soc. Victoria, Proc., vol. 2, p. 111, 1873 (type loc., Noumea, New Caledonia).

Head 2 3/4; depth 3; D, XI, 15; A. III, 8; scales 66 in lateral line, 9 above, 14 below; eye 4 1/2 in head; preopercle finely serrate behind, not below, gashed. Cheek scales in 4 rows and more on lower portion. Red-pink, head lighter. Scales on sides and back margined black. Sulphur-yellow stripe from front eye edge toward mouth and same color around orbit; rather broad yellow band from opercle to caudal base. Fins scarlet. Length 330 mm. (Castelnau)

This nominal species is somewhat suggestive of *Lutjanus erythropterus,* but is described with more dorsal rays, though with somewhat similar color pattern.

Lutjanus biguttatus (Valenciennes).

Serranus biguttatus Valenciennes: Hist. nat. Poiss., vol. 6, p. 381, 1830 (type loc., Trinquimale, Ceylon; Amboina).

Lutjanus biguttatus Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 116, 1913 (Majalibit Bay, Waigiu).

Head 3 to 3 1/5; depth 3 1/3 to 4; D. XI, 11 to 13; A. III, 8 or 9; scales 65 along above lateral line, 52 along below lateral line, 5 above, 14 below, 13 predorsal; snout equals eye, 3 in head, 2/3 to 1 in interorbital; maxillary to eye center. Cheek scales in 5 or 6 rows. Olive or olive-gray above, below gray to golden-yellow. Dusky median lateral band from snout tip to supero-median caudal rays to tips. Above lateral line white spot less than pupil below middle of spinous dorsal and another below middle of soft dorsal. Fins yellowish, with dusky at basal edge of pectoral above. Length 206 mm. (Bleeker)

Easily distinguished by the median dark lateral band and two white spots above the lateral line.

Ceylon, East Indies, Melanesia.

Lutjanus sebae (Cuvier).

Diacope sebae Cuvier: Hist. nat. Poiss., vol. 2, p. 310, 1828 (type loc., Waigiu; Pondicherry; Java).

Genyoroge sebae Günther: Cat. fishes Brit. Mus., vol. 1, p. 176, 1859 (Louisiades).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 10, 1885 (Rubi, New Guinea).

Mesoprion sebae Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).

Lutjanus sebae Bleeker: Atlas ichth., vol. 8, p. 62, pl. (72) 350, fig. 2, 1876-77 (Waigiu; New Guinea).

Head 2 2/3 to 2 3/4; depth 2 to 3 1/4; D. XI, 16 or 17; A. III, 10 or 11; scales 64 along above lateral line, 60 along below lateral line, 8 above, 19 or 20 below, 14 or 15 predorsal to occciput; eye 1 4/5 in snout, 4 to 4 2/3 in head, 2/5 to 4/5 diameter distant; maxillary reaches little beyond front eye edge, not to pupil; preopercle edge finely serrate behind, with notch. Cheek with 6 rows of scales. Rosy to yellowish-rosy. Broad red-brown band from spinous dorsal to eye and maxillary. Another from highest dorsal rays to behind pectoral base wider. Third from last dorsal spines across side of tail and along lower edge of caudal to tip. Soft dorsal and anal bordered red-brown above, each with narrow white margin. Dark blotch at each point of caudal with white tip. Ventral dark. Iris yellow or rosy. Length 260 mm. (Bleeker)

Jouan describes it from Port de Kanala, New Caledonia, as *Diacope* No. 52 (Soc. Cherbourg, Mem., vol. 8, p. 273, 1861): D. XI, 16; A. III, 11. Hind preopercle edge deeply gashed, with bony tubercle. Caudal little emarginate. Red above, white with rose tinge below. Two broad red bands across body. Fins deep red. Length 800 mm.

Aden, Zanzibar, Mozambique, India, East Indies, Melanesia.

Lutjanus fulvus (Schneider).

Holocentrus fulvus Schneider: Systema ichth., Bloch, p. 318, 1801 (type loc., Tahiti).

Perca fulva (Forster) Schneider: Systema ichth., Bloch, p. 318, 1801 (name in synonymy).—Cuvier: Hist. nat. Poiss., vol. 2, p. 329, 1828 (name in text).—Lichtenstein: Descriptiones animalium, p. 193, 1844 (Tahiti).

Diacope fulva Cuvier: Hist. nat. Poiss., vol. 2, p. 329, 1828 (Tahiti).

Mesoprion fulvus Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 13, 1873 (type).

Head 2 1/2; depth 2 2/3; D. XI, 13; A. III, 8; scales 72 along lateral line above, 61 along lateral line below, 9 above, 21 below; eye 1 1/3 in snout, 3 2/3 in head, 3/4 diameter distant; maxillary reaches to front fourth of eye; preopercle edge serrate, with deep gash. Cheek with about 12? rows of scales. Yellowish-red. Fins yellow. Upper third of dorsal black, with white margin. Caudal with black edge and white margin. Dark mark across middle of first third of anal. Dark spot in pectoral axil. Length 254 mm. (Day)

Though Günther describes the type, an old bleached example, Day gives a much better account (Fishes of India, pt. 1, p. 34, pl. 10, fig. 5, 1875).

Andamans, Tahiti.

Lutjanus semicinctus Quoy and Gaimard.

Lutjanus semicinctus Quoy and Gaimard: Voyage "Uranie," Zool., p. 303, 1824 (type loc., Rawak; Waigiu).

Mesoprion semicinctus Cuvier: Hist. nat. Poiss., vol. 2, p. 367, 1828 (Waigiu).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 2, 1859 (Doreh, New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 15, pl. 17, 1873 (Kingsmills).—Günther: Rept. voyage "Challenger," vol. 1, p. 34, 1880 (Levuka, Fiji).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 231, 1882 (New Guinea).

Lutjanus semicinctus Bleeker: Atlas ichth., vol. 8, p. 63, pl. (63) 341, fig. 3, 1876-77 (Waigiu; New Guinea).

Lutianus semicinctus Seale: B. P. Bishop Mus., Occ. Papers, vol. 6, no. 1, p. 43, 1906 (Shortland Island, Solomons).

Mesoprion sexfasciatus Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 255, 1883 (type loc., Normanby River, in fresh water, New Guinea).

Head 2 3/5; depth 2 7/8; D. X, 12, 1; A. III, 8, 1; scales 57 in lateral line to caudal base and 10? more on latter; tubular scales 48 in lateral line to caudal base and 6 more on latter; 8 scales above lateral line, 15 below; 12 predorsal scales; snout 2 2/3 in head measured from upper jaw tip; eye 5 1/10; maxillary 2 1/2; interorbital 5 1/4. Least depth of caudal peduncle 3 1/10 in total head length. Head width 2 1/8 in its length. Snout conic, long as wide. Teeth in bands in jaws, 6 canines above in front and 16 enlarged teeth along front and sides of lower jaw, none large as largest upper canines; narrow bands of fine teeth on vomer and palatines. Maxillary reaches eye; expansion 1 2/3 in eye. Preopercle slightly emarginate on lower hind edge and with few obsolete denticles. Gill rakers VI, 1 + 7, VII, lanceolate; gill filaments 3/4 of gill rakers or 1 1/3 in eye. Scales with 17 to 20 basal radiating striae; apical denticles 96 to 102, basal elements in 5 to 9 rows; circuli fine. Scales in oblique rows above lateral line, in horizontal rows below. Cheek with 8 rows of scales. Suprascapula denticulate. Fourth dorsal spine 2 7/8 in head; fourth dorsal ray 3; second anal spine 3 1/5; second anal ray 2 4/5; caudal emarginate behind, 1 1/2; pectoral nearly reaches anal, 1 1/4; ventral 1 7/8. Dull brown, paler below. Back with 7 broad dusky streaks, narrowing below. Large dusky blotch, nearly twice size of eye at caudal base. Fins dull brown. Iris slaty. Length 247 mm.

One in the Bishop Museum from Shortland Island. Two in the National Museum from New Guinea, 228 and 234 mm. One from Society Islands in the Agassiz Museum obtained by Andrew Garrett, 253 mm.

The imperfect account of *Mesoprion sexfasciatus*, described as grayish-green with 6 narrow light colored fasciae on each side, likely pertains to the present species.

East Indies, Melanesia, Polynesia.

Lutjanus bohar (Forskål).

Sciaena bohar Forskål: Descriptiones animalium, pp. 11, 46, 1775 (type loc., Arabia).

Mesoprion bohar Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 13, pl. 15, 1873 (Society Islands; Paumotus).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 12, 1877 (Upolu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 231, 1882 (New Guinea).

Lutjanus bohar Bleeker: Atlas ichth., vol. 8, p. 64, pl. (70) 348, fig. 4, 1876-77 (southeast New Guinea).—Vaillant: Soc. Philom. Paris, Bull., 7th ser., vol. 1, p. 61, 1886-87 (Tahiti).

Lutianus bohar Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 485, 1899 (Thornton Island).—Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1,

p. 130, 1902 (1903) (Marcus Island).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 6, no. 1, p. 43, 1906 (Shortland Island, Solomons).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 262, 1905 (1906) (Pago Pago).

Mesoprion quadriguttatus Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).

Mesoprion flaviroseus De Vis: Linn. Soc. New South Wales, Proc., vol. 8, p. 446, 1883 (type loc., New Britain).

Lutianus nukuhivae Seale: B. P. Bishop Mus., Occ. Papers, vol. 6, no. 1, p. 40, fig. 5 (no. 2164), 1906 (type loc., Nukuhiva, Marquesas Islands).

Head 2 3/4; depth 2 3/4; D. X, 14, 1; A. III, 8, 1; tubular scales 50 in lateral line to caudal base and 7 more on latter; scales 60 in lateral line to caudal base and 14 more on latter; 9 scales above lateral line, 18 below; 18 predorsal scales; snout 2 2/5 in head; eye 4 4/5; maxillary 2 1/5; interorbital 3 3/5. Least depth of caudal peduncle 3 in its length. Head width 2 in its length. Fourth dorsal spine 2 3/4 in head; fifth dorsal ray 3; third anal spine 3 3/5; second anal ray 2 1/2; caudal 1 2/5; pectoral 1 1/4; ventral 1 7/8. Length 458 mm.

In the Bishop Museum 1 obtained at Palmyra by C. Montague Cooke, Jr., in 1917, 1 Marcus Island and 1 Shortland Island. Also the type of *Lutianus nukuhivae,* 196 mm. long. It is difficult to account for this nominal form as it in no way differs from the specimen of *Lutianus bohar* recorded further on from Shortland. In the Agassiz Museum an adult from Upolu and half-grown from Apiang in the Gilbert Islands, the half-grown specimen from Andrew Garrett.

Mesoprion flavirosca De Vis is evidently this species, a variant. It is described with "a faint spot over lateral line beneath origin of soft dorsal, another fainter on end of caudal peduncle above, middle rays of caudal dark" and "in the young the spots on the body are rather more distinct."

Red Sea, India, East Indies, Melanesia, Polynesia to Palmyra Island.

Lutjanus fulviflamma (Forskål).

Sciaena fulviflamma Forskål: Descriptiones animalium, pp. 11, 45, 1775 (type loc., Arabia).

Mesoprion fulviflamma Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 13, 1869 (Kandavu).—Schmeltz: op. cit., vol. 5, p. 22, 1874 (Kandavu; Savaii).—Günther: Rept. voyage "Challenger," vol. 1, pp. 34, 58, 1880 (Kandavu and Levuka, Fiji; Tongatabu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 232, 1882 (New Guinea).

Mesaprion fulviflamma Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 255, 1883 (Hood Bay, New Guinea).

Lutjanus fulviflamma Bleeker: Atlas ichth., vol. 8, p. 65, pl. (66) 344, fig. 3, 1876-77 (southeast New Guinea).

Lutianus fulviflamma Waite: Australian Mus., Mem., no. 3, p. 183, 1897 (Funafuti, Ellice Islands).

Mesoprion naborer Thiollière: Fauna Woodlark, p. 146, 1857 (type loc., Woodlark Island).

Mesoprion terubuan Thiollière: Fauna Woodlark, p. 146, 1857 (type loc., Woodlark Island).

Lutianus ehrenbergii Peters: Akad. Wiss. Berlin, Monatsb., p. 831, 1876 (1877) (Cartaret Harbor, New Ireland; New Britain).

Lutianus russelli Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 43, 1906 (Shortland Islands).

Lutianus fuscescens (non Valenciennes) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 43, 1906 (Tahiti).

Lutianus melanesiae Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 43, fig. 5 (no. 1187), 1906 (type loc., Shortland Island, Solomons).

Head 2 2/3; depth 2 3/4 to 3; D. X, 13, 1; A. III, 8, 1; scales 45 to 47 in lateral line to caudal base and 5 to 12 more on latter; tubular scales 43 to 46 in lateral line to caudal base and 3 to 8 more on latter; 6 or 7 scales above lateral line, 12 to 14 below; 11 or 12 predorsal scales; snout 3 1/4 in head measured from upper jaw tip; eye 3 1/10 to 4; maxillary 2 1/10 to 2 2/5; interorbital 4 to 5. Least depth of caudal peduncle 2 4/5 to 3 2/5 in total head length. Head width 2 1/6 to 2 2/3 in its length. Snout conic, long as wide. Jaws about even. Maxillary reaches opposite eye center Preopercle edge denticulate, notch obsolete and no denticle opposite shallow emargination. Gill rakers IV, 2 + 9, lanceolate; gill filaments 3/4 of gill rakers, which 2 1/5 in eye.

Scales with 10 basal radiating striae; apical denticles 36 to 38, basal elements in 2 or 3 series. Scales above lateral line in oblique series, below in horizontal series. Third dorsal spine 2 1/3 to 2 1/2 in head; third dorsal ray 2 7/8 to 3 1/10; third anal spine 2 2/3 to 3 1/3; second anal ray 2 1/3 to 3 1/3; caudal 1 1/4 to 1 1/2; pectoral 1 1/4 to 1 2/5; ventral 1 2/3 to 1 3/4. Mostly deep uniform brownish. Membrane of spinous dorsal dusky. Black blotch on lateral line below last dorsal spines and at front of soft rays 2/3 of eye. Caudal slightly emarginate behind. Front border of ventral dusky.

In the Bishop Museum 1 from Tahiti of 55 mm., 3 Shortland Island and the type of *Lutianus melanesiae,* largest 228 mm. The National Museum has 2 from New Guinea, larger 243 mm. In the Agassiz Museum 1 from Meos Bundi, Wiak Island, New Guinea. Also one from the Society Islands obtained by Andrew Garrett. In both this and the preceding the lateral line passes through the dark lateral blotch. Three half-grown from Rev. B. G. Snow, taken at Ebon Island, 1877.

The species *Lutjanus fulviflamma* differs from *Lutjanus monostigma* in the much narrower preorbital and infraorbital and larger eye. The description of *Lutianus ehrenbergii* Peters (Akad. Wiss. Berlin, Monatsb., p. 704, 1869, type loc., Massaua, Red Sea) seems to show it is based on a variant with a large eye. Possibly the imperfect account of *Mesoprion naborer* Thiollière may really be intended for *Lutjanus falviflamma.* It is said to be silvery, the fins yellow, and have 7 longitudinal brown lines of which lowest yellow. The dark blotch below the front of the soft dorsal is not mentioned. Likewise *Mesoprion terubuan* Thiollière is evidently another synonym. It is noted with back golden, head brown, below white, fins yellow, 5 longitulinal yellow lines and a black lateral spot on the tail on the lateral line.

Red Sea, Zanzibar, Mozambique, Seychelles, India, East Indies, China, Queensland, Melanesia, Polynesia.

Jouan describes it from Port de France, New Caledonia, as *Serranus* No. 62 (Soc. Cherbourg, Mem., vol. 8, p. 281, 1861): D. X, 10 to 14; A. III, 6 to 9. Gray-black. Head black above. Cheeks rosy. Below yellowish. Six longitudinal golden-yellow bands on flanks below lateral line. Elongate clouded black blotch each side on lateral line opposite anal. Fins yellow. Length 150 mm.

Lutjanus flavipes (Valenciennes).

Diacope flavipes Valenciennes: Hist. nat. Poiss., vol. 6, p. 401, 1830 (type loc., Vanicolo).

Diacope analis Valenciennes: Hist. nat. Poiss., vol. 6, p. 402, 1830 (type loc., Mauritius; New Guinea).

Diacope aurantiaca Valenciennes: Hist. nat. Poiss., vol. 6, p. 403, 1830 (type loc., Vanicolo).

Head 3; depth 2 2/5 to 2 1/2; D. X, 15; A. III, 8; scales 65 to 68 along lateral line above, 50 to 52 along lateral line below, 8 or 9 above, 17 or 18 below, 12 or 13 predorsal to occiput; eye 1 2/3 in snout, 3 2/5 to 3 1/2 in head, 2/3 to 3/4 diameter distant; maxillary reaches opposite front of pupil; preopercle edge denticulate, with gash. Cheek with 6 or 7 rows of scales. Body violaceous or rosy above, sides paler, below yellowish. Iris yellow or rosy. Each row of scales above lateral line forms single oblique gold-brown or deep violaceous line. Sides with 4 longitudinal golden bands below lateral line. Dorsals and caudal rosy or golden, broadly margined dusky. Other fins rosy, yellow or golden. Length 190 mm. (Bleeker)

Mauritius, East Indies, Micronesia.

Lutjanus lineatus (Quoy and Gaimard).

Diacope lineata Quoy and Gaimard: Voyage "Uranie," Zool., p. 309, 1824 (type loc., Rawak; Waigiu).

Lutjanus lineatus Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).—Bleeker: Atlas ichth., vol. 8, p. 69, pl. (26) 304, fig. 4, 1876-77 (Waigiu).—Streets: U. S. Nat. Mus., Bull., no. 7, p. 90, 1877 (Christmas Island).

Lutianus lineatus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 264, 1905 (1906) (Apia).

Serranus limbatus Valenciennes: Hist. nat. Poiss., vol. 2, p. 228, 1828 (type loc., Guam).

Diacope striata (Quoy and Gaimard) Cuvier: Hist. nat. Poiss., vol. 2, p. 324, 1828 (type loc., Waigiu; Bourou).

Head 2 3/4 to 3; depth 2 1/2 to 2 3/4; D. X, 13 or 14; A. III, 8 or 9; scales 70 along lateral line above, 60 along lateral line below, 8 or 9 above, 15 or 16 below, 12 or 14 predorsal to occiput; eye 1 2/5 in snout, 3 to 4 1/2 in head, 2/3 to 1 diameter distant; maxillary reaches nearly opposite eye center; hind preopercle edge finely denticulate, with slight emargination. Cheek with 7 rows of scales. Olive above, white below. Iris yellow. Young with broad, median, lateral brown band, from eye to caudal, disappearing with age. Scales each with brown or golden-brown spot, forming longitudinal streaks on head and body. Dorsals and caudal violaceous, broadly margined dusky. Other fins rosy or yellow. Length 355 mm. (Bleeker)

In the National Museum 1 adult from Christmas Island and 2 young from Apia.

Jouan describes *Serranus* No. 60 from Kanala, New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 280, 1861) which may be this species, except for its anal formula: D. X, 9; A. III, 8. Caudal emarginate. Reddish-brown on back and flanks, yellowish-white below. Longitudinal deep brown line from eye to tail. Length 110 mm.

East Indies, Melanesia, Micronesia, Polynesia.

Lutjanus vaigiensis (Quoy and Gaimard).

Diacope vaigiensis Quoy and Gaimard: Voyage "Uranie," Zool., p. 307, 1824 (type loc., Waigiu).

Diacope immaculata (Quoy and Gaimard) Cuvier: Hist. nat. Poiss., vol. 2, p. 325, 1828 (type loc., Waigiu).

Depth 3 1/2 in total length; D. X, 15; A. III, 9. Front elevated. Snout elongate, pointed. Preopercle denticulate. Back with brown oblique lines, below horizontal ones. Eye yellowish-green. General color yellowish, more clear to silvery below. Throat white. Dorsal white, with black line. Caudal with brown median blotch. Ventral and anal yellow. Length 133 mm. (Quoy and Gaimard)

A very imperfectly known species. Günther reports a dried specimen from Port Essington as *Mesoprion waigiensis* (Cat. fishes Brit. Mus., vol. 1, p. 191, 1859). From this following additional items may be noticed:

Depth 3 2/3, equals head; eye 4 2/3 in head; preopercle notched and pectoral base with narrow black spot.

Lutjanus marginatus (Cuvier).

Diacope marginata Cuvier: Hist. nat. Poiss., vol. 2, p. 320, 1828 (type loc., Pondicherry; Oualan).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 13, 1869 (Upolu).

Mesoprion marginatus Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).—Kner: Reise "Novara," Fische, vol. 1, p. 31, 1865 (Tahiti).—Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 13, pl. 14, 1873 (Tahiti).—Günther: Rept. voyage "Challenger," vol. 1, p. 34, 1880 (Levuka, Fiji).

Lutjanus marginatus Bleeker: Atlas ichth., vol. 8, p. 69, pl. (71) 349, fig. 2, 1876-77 (Waigiu; southeast New Guinea).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1379, 1906 (Upolu).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 9, 33, 1925 (Guam; Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 14, 1925 (Wake Island).—Fowler: op. cit., Bull. 38, p. 15, 1927 (Palmyra, Fanning and Jarvis islands).

Lutianus marginatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 41, 1906 (Faté; Shortland Island; Tahiti).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 263, 1905 (1906) (Pago Pago; Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p 286, 1911 (Makemo, Paumotus; Borabora, Society Islands; Kusaie and Truck Group, Carolines; Arhno Atoll, Marshalls; Suva, Fiji; Taritari, Gilberts).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 112, 1912 (Rikitea, Mangareva, Gambier Islands).

Genyoroge marginata Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 487, 1899 (Thornton Island).—Fowler: op. cit., p. 527, 1900 (Samoa).

Diacope axillaris Valenciennes: Hist. nat. Poiss., vol. 6, p. 400, 1830 (type loc., East Indies; Vanicolo).

Mesoprion marginipinnis Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 254, 1883 (type loc., Normanby Island, in fresh water, New Guinea).

Lutianus fulvus (non Schneider) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 78, 1900 (1901) (Guam).—Seale: op. cit., vol. 4, no. 1, p. 40, 1906 (Tahiti).

Lutianus erythropterus (non Bloch) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 78, 1900 (1901) (Guam).

Lutianus marginatoides Kendall and Goldsborough:

Mus. Comp. Zool., Mem., vol. 26, p. 287, pl. 4, fig. 1, 1911 (type loc., Makemo, Paumotus Islands).

The National Museum contains 2 from Fiji and 1 from Samoa, obtained by the Wilkes Expedition. Other specimens are the type of *Lutianus marginatoides,* 1 Borabora, 1 Makemo, 1 Truck, 3 Arhno Atoll, 1 Kusaie, 1 Suva, 1 Rikitea at Mangareva, 10 Apia, 1 from Samoa through C. H. White, and 1 Tahiti. In the Agassiz Museum 3 from Apia and 1 from Ascension Island in the Marshall Islands, from Rev. A. A. Strong in 1877. These differ in having the dusky of the caudal extending on the caudal peduncle superiorly. In the Academy 3 from Apia and 1 Thornton Island. In the Bishop Museum 3 from Shortland Island, 5 Faté, 4 Tahiti, 1 Tubuai, 2 Nukuhiva, 24 Guam; 1 Palmyra from C. Montague Cooke, Jr., in 1917, 1 also by Thurston and Thaanum in 1922, and 2 from T. Kawaguchi, March 14, 1922, larger of which 718 mm. Two from Wake Island, obtained by the Tanager Expedition in 1923. Also 4 from Guam in 1923.

The specimen obtained by Thurston and Thaanum with spinous dorsal largely dull red, basally pale olive and marginally slightly dusky. Soft dorsal with ruddy tint medianly, broadly dusky submarginally and edge narrowly whitish. Caudal dusky, hind edge narrowly whitish. Other fins all lemon-yellow. Back and upper surface buff-olive, edges of scales olivaceous. Lower surface of body yellowish-buff. Sides and lower surface of head blushed pink. Iris pale yellowish. Length 253 mm.

Zanzibar, Mozambique, India, East Indies, Melanesia, Micronesia, Polynesia.

Lutjanus rubens (Macleay).

Mesoprion rubens Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 232, 1882 (type loc., New Guinea).

Mesaprion rubens Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 255, 1883 (Hood Bay, New Guinea).

Depth 3 in total, little more than head; D. X, 14; A. III, 8; eyes nearly 3 diameters apart, 2 in snout; maxillary to eye center; preopercle unevenly serrated, gashed. Scales rather large. Back dark brown, vermilion on belly, pearly lines along sides. Few spots on head below eyes. Fins violet, margined black. Length over 750 mm. (Macleay)

An imperfectly described nominal species, perhaps an old stage of *Lutjanus marginatus?*

Lutjanus gibbus (Forskål) (Pl. XVIII, *A*).

Sciaena gibba Forskål: Descriptiones animalium, pp. 11, 46, 1775 (type loc., Arabia).

Mesoprion gibbus Günther: Mus. Godeffroy, Jour., vol. 1, pt. 11, p. 12, pls. 12-13, fig. A, 1873 (Samoa; Society Islands).

Genyoroge gibba Schmeltz: Mus. Godeffroy, Cat. 6, p. 11, 1877 (Tahiti; Yap).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 10, 1885 (Rubi, New Guinea).

Lutianus gibbus Peters: Akad. Wiss. Berlin, Monatsb., p. 831, 1876 (1877) (Carteret Harbor, New Ireland).—Waite: Australian Mus. Mem., no. 3, p. 183, 1897 (Funafuti, Ellice Island).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 42, 1906 (Tahiti; Shortland Island; Faté).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 262, 1905 (1906) (Apia; Pago Pago).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 286, 1911 (Suva, Fiji; Rangiroa, Makemo and Fakarava, Paumotus; Takaa, Society Islands; Taritari, Gilberts; Rougelab and Arhno Atoll, Marshalls).

Lutjanus gibbus Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1379, 1906 (Upolu).—Pellegrin: Mus. Paris, Bull. 18, p. 206, 1912 (Port Sandwich, New Hebrides.)—Fowler: B. P. Bishop Mus., Bull. 22, p. 33, 1925 (Samoa).—Fowler: B. P. Bishop Mus., Bull. 38, p. 15, 1927 (Palmyra Island).

Diacope gibba Vaillant: Soc. Philom. Paris, Bull., 7th ser., vol. 11, p. 61, 1886-87 (Rangiroa, Paumotus).

Diacope borensis Cuvier: Hist. nat. Poiss., vol. 2, p. 329, 1828 (type loc., Borabora).

Diacope tica Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 231, pl. 23, 1830 (type loc., Borabora).

Diacope bottonensis Valenciennes: Hist. nat. Poiss., vol. 6, p. 402, 1830 (New Guinea).

Mesoprion bottonensis Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).

Genyoroge bottonensis Schmeltz: Mus. Godeffroy, Cat. 4, p. 13, 1869 (Upolu).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 22, 1874 (South Sea).

Lutjanus butonensis Bleeker: Atlas ichth., vol. 8, p. 59, pl. (37) 315, fig. 3, 1876-77 (New Guinea).

Genyoroge bidens Macleay, Linn. Soc. New South Wales, Proc., vol. 7, p. 230, 1882 (type loc., New Guinea).

Mesoprion goldiei Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 233, 1882 (type loc., New Guinea).

Mesaprion goldiei Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 255, 1883 (Hood Bay, New Guinea).

Genyoroge melanura De Vis: Linn. Soc. New South Wales, Proc., vol. 8, p. 457, 1883 (New Britain).

Lutianus erythropterus (non Bloch) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 78, 1900 (1901) (Guam; one specimen).

Lutianus tahitiensis Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 40, fig. 13 (No. 1390), 1906 (type loc., Tahiti).

Head 2 1/2 to 2 3/5; depth 2 1/4 to 3; D. X, 14, 1 or 15, 1; A. III, 8, 1; tubular scales 48 to 51 in lateral line to caudal base and 6 more on latter; scales 55 to 67 in lateral line to caudal base; 6 to 9 scales above lateral line, 17 to 19 below; 11 to 17 predorsal scales; snout 3 3/5 to 4 in head measured from upper jaw tip; eye 3 1/5 to 5 1/5; maxillary 2 2/5 to 2 3/4; interorbital 4 1/8 to 4 1/6. Least depth of caudal peduncle 3 1/2 in total head length. Head width 2 1/2 in its length. Snout long as wide. Maxillary reaches opposite front pupil edge; expansion 2 1/2 in eye. Preopercle edge denticulate, ends in strong spine at angle nearly long as pupil. Gill rakers 8+11, lanceolate; gill filaments 3/4 of gill rakers, which 1 3/4 in eye. Scales in oblique series, both above and below lateral line. Third dorsal spine 1 3/4 in head; tenth dorsal ray 2 1/2; second anal spine 2; third anal ray 3; caudal 1 2/5; pectoral 1 3/5; ventral 1 3/4.

The Bishop Museum contains the type of *Lutianus tahitiensis,* besides 7 specimens from Tahiti, 3 Faté, 1 Shortland Island, 1 Palmyra obtained by J. W. Thompson March 18, 1922,

and 1 Fanning by C. H. Edmondson and S. C. Ball, 1922. Largest 409 mm. In the National Museum 5 Apia, 1 Makemo, 1 Rangiroa, 2 Arhno Atoll, 1 Taritari, 2 Suva, 2 from New Guinea and young from Tahiti obtained by W. H. Jones, June 12-15, 1883. The Agassiz Museum contains 2 from Apia, 1 Ebon Island obtained by Rev. B. G. Snow in April 1877 and 9 from Meos Bundi, Wiak Island, New Guinea, by Thomas Barbour.

Genyoroge bidens is based on 2 specimens 280 mm. long. They are said to have a posterior gash with a large knob and below a smaller notch with an obtuse tooth from the sub- and interopercular suture. I am unable to find any characters on which to maintain *Lutianus tahitiensis*, a nominal form apparently never compared with *Lutjanus gibbus*.

Red Sea, Andamans, East Indies, Melanesia, Micronesia, Polynesia.

Lutjanus caudalis (Valenciennes).

Mesoprion caudalis Valenciennes: Hist. nat. Poiss., vol. 6, p. 404, 1830 (type loc., Vanicolo).

D. X, 13; A. III, 7; preopercle serrae very fine, gash deep, smooth, horizontal edge with strong teeth. Back olive-gray or yellowish. Flanks and abdomen silvery. About 20 longitudinal violet streaks each side, of which 6 above lateral line. Spinous dorsal dusky-gray. Other fins pale yellow, except slightly rounded caudal, which has large triangular violet blotch edged with yellowish-white. Length 152 mm. (Valenciennes)

Lutjanus monostigma (Cuvier) (Pl. XVIII, *B*).

Mesoprion monostigma Cuvier: Hist. nat. Poiss., vol. 2, p. 337, 1828 (type loc., Seychelles).—Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 14, pl. 16, 1873 (Kingsmills; Society Islands: Paumotus).—Günther; Rept. voyage "Challenger," vol. 1, p. 56, 1880 (Nares Harbor Admiralty Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 232, 1882 (New Guinea).

Mesaprion monostigma Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 255, 1883 (Hood Bay, New Guinea).

Lutianus monostigma Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 74, 1900 (1901) (Guam).—Seale: op. cit., vol. 4, no. 1, p. 40, 1906 (Tubuai; Fate; Marquesas Islands).—Jordan and Seale: U. S. Bur. Fish., Bull., vol. 25, p. 264, 1905 (1906) (Apia; Pago Pago).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 287, 1911 (Anaa, Makemo and Makatea, Paumotus; Moen, Truk Group, Carolines; Taritari, Gilberts).

Lutjanus monostigma Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 117, 1913 (Saonek, Waigiu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 9, 1925 (Guam).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 14, 1925 (Wake Island.)—Fowler: op. cit., Bull. 38, p. 15, 1927 (Palmyra, Washington, Jarvis and Baker islands).

Lutjanus lioglossus Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).

Lutianus fulviflamma (non Forskål) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 43, 1906 (Shortland Island).

Resembles *Lutjanus lutjanus* but easily distinguished by the black blotch on the lateral line below front of soft dorsal.

The Bishop Museum contains 2 from Faté, 1 Tubuai, 3 Shortland Island, 2 Nukuhiva, 2 Guam, 3 Rarotonga and 1 from Palmyra Island obtained by C. Montague Cooke, Jr., in 1917. One from Wake Island by the Tanager and 1 from Guam in 1923. Largest 305 mm. The National Museum has 2 from New Guinea, 1 Apia, 2 Makemo, 2 Makatea, 1 Tari Tari, 1 Anaa, 5 Moen. In the Agassiz Museum 2 from Makemo.

Red Sea, India, East Indies, Melanesia, Micronesia, Polynesia.

Lutjanus rivulatus (Cuvier).

Diacope rivulata Cuvier: Hist. nat. Poiss., vol. 2, p. 312, pl. 38, 1828 (type loc., Coromandel; Java; Red Sea; Malabar).

Genyoroge rivulata Schmeltz: Mus. Godeffroy, Cat. 6, p. 11, 1877 (Samoa).

Lutjanus rivulatus Bleeker: Atlas ichth., vol. 8, p. 73, pl. (69) 347, fig. 3, 1876-77 (Waigiu).

Lutianus rivulatus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 262, 1905 (1906) (Apia).

Diacope sinal Thiollière: Fauna Woodlark, p. 145, 1857 (type loc., Woodlark Island).

Lutjanus coeruleopunctatus Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).

Mesoprion parvidens Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 234, 1882 (type loc., New Guinea).

Head 2 1/2 to 3; depth 2 1/4 to 2 2/5; D. X, 15 or 16; A. III, 8 or 9; scales 54 to 56 above along lateral line, 50 to 52 below along lateral line, 8 above, 16 below, 10 or 11 predorsal to occiput; eye 1 2/3 in snout, 3 to 4 in head, 1/2 to 1 diameter distant; maxillary reaches front pupil edge; preopercle edge denticulate, with gash. Cheek with 6 or 7 rows of scales. Rosy, whitish below. Eye yellowish-green, golden ring around pupil. Head with numerous longitudinal blue lines. Back with 7 transverse dusky bands to lateral line. White spot with dark border on lateral line below front of soft dorsal. Fins rosy. Length 235 mm. (Bleeker)

The Agassiz Museum has 6 from the Society Islands, largest 330 mm. Also 21 from Apiang in the Gilbert Islands. In the National Museum 1 from Apiang.

Diacope sinal is described as back gray, below reddish and both dotted white, vertical blue lines on the head, black blotch on tail and preopercle gash deep.

Mesoprion parvidens is described from a specimen about 204 mm. long: Blackish, every scale with pearly portion, larger on belly; probably red in life. Cheek with blue transverse streaks. Whitish spot on lateral line below middle of soft dorsal. Vertical fins and tail very dark. Pectoral black on upper rays. Ventral rays yellow, membranes black.

Red Sea, Zanzibar, Mauritius, India, East Indies, China, Melanesia, Polynesia.

Lutjanus argentimaculatus (Forskål).

Sciaena argenti-maculata Forskål: Descriptiones animalium, pp. 11, 47, 1775 (type loc., Arabia).

Lutjanus argentimaculatus Bleeker: Atlas ichth., vol. 8, p. 74, 1876-77 (Waigiu; New Guinea).—Vaillant: Soc. Philom. Paris, Bull., 7th ser., vol. 11, p. 60, 1886-87 (Rangiroa, Tuamotus).

Lutianus argentimaculatus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 262, 1905 (1906) (Apia).

?Diacope rosea Valenciennes: Hist. nat. Poiss., vol. 6, p. 404, 1830 (type loc., Ulea, Caroline Archipelago).

Mesoprion gembra Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 13, 1869 (Pelew Islands; Samoa).—Schmeltz: op. cit., Cat. 5, p. 22, 1874 (Tonga; Pelew Islands; Samoa).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 231, 1882 (Cuppa Cuppa, New Guinea).

Mesoprion garretti Günther: Mus. Godeffroy, Jour., vol. 1, no. 1, p. 15, pl. 13, fig. B, 1873 (type loc., Kingsmill Islands).

Head 2 1/2 to 3; depth 2 2/5 to 2 4/5; D. X, 13 or 14; A. III, 8 or 9; scales 41 to 44 along lateral line above, 47 to 52 along lateral line below, 6 or 7 above, 14 or 15 below, 12 predorsal; eye 1 1/4 in snout, 3 1/4 to 4 1/2 in head, 2/3 to 1 in interorbital; maxillary reaches front pupil edge; hind preopercle edge denticulate, without gash. Cheek with 8 rows of scales. Above deep olive, below yellowish-green, fins golden or yellowish-green. Each scale on body with darker basal blotch. Iris yellowish or greenish. Young with 8 to 11 transverse silvery lines. Cheek to hind opercle edge with 1 or 2 horizontal blue or greenish lines. Length 455 mm. (Bleeker)

In the National Museum 2 from Apia. Ten specimens in the Agassiz Museum from the Society Islands, obtained by Andrew Garrett. Largest 254 mm.

Possibly *Mesoprion maus* Thiollière (Fauna Woodlark, p. 147, 1857, type loc., Woodlark Island) is *Lutjanus argentimaculatus*. It is briefly noticed: White, burnished above. Dorsal and caudal brownish-red, other fins yellow. Two longitudinal yellow bands on cheek and some others little distinct on body.

Red Sea, India, East Indies and Australia to the Tuamotus.

Lutjanus niger (Forskål).

Sciaena nigra Forskål: Descriptiones animalium, pp. 11, 47, 1775 (type loc., Djedda).

Diacope macolor Lesson: Soc. Hist. Nat., Paris, Mem., vol. 4, p. 409, 1828 (type loc., Dorey Harbor, New Guinea).—Cuvier: Hist. nat. Poiss., vol. 2, p. 313, 1828 (New Guinea).—Lesson: Voyage "Coquille," vol. 2, pt. 1, p. 230, pl. 22, fig. 3, 1830 (Dorey, New Guinea).

Genyoroge macolor Schmeltz: Mus. Godeffroy, Cat. 4, p. 13, 1869 (Kandavu, Fiji).—Schmeltz: op. cit., Cat. 5, p. 22, 1874 (Kandavu; Pelew Islands).

Mesoprion macolor Günther: Mus. Godeffroy, Jour., vol. 1, pt. 1, p. 11, 1873 (Samoa).

Lutjanus macolor Bleeker: Atlas ichth., vol. 8, p. 75, pl. (65) 343, fig. 3, 1876-77 (Waigiu; New Guinea).

Macolor typus Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).

Head 2 5/6 to 3 1/5; depth 2 1/3 to 2 2/3; D. X, 13 to 15; A. III, 10 to 12; scales 70 along above lateral line, 65 along below lateral line, 8 above, 20 to 22 below, 15 predorsal to occiput; eye equals snout, 2 3/4 to 3 2/5 in head, 3/5 to 1 diameter distant; maxillary reaches opposite eye center; hind preopercle edge minutely serrate, below with larger serrae around angle, gash deep. Cheek with 6 to 8 rows of scales. Above and sides black or brown, below pale or whitish. In young head with white transverse rostral band and another on opercle. Back with few large pale spots. Side inferiorly with longtitudinal blackish-brown band. Length 280 mm. (Bleeker)

Red Sea, Zanzibar, East Indies, Melanesia, Micronesia, Polynesia.

POMADASIDAE

Caesio cuning (Bloch).

Sparus cuning Bloch: Nat. ausländischen Fische, pt. 5, p. 31, pl. 263, fig. 1, 1791 (type loc., East Indies).

Odontonectes erythrogaster Schmeltz: Mus. Godeffroy, Cat. 4, p. 13, 1869 (Viti Levu and Samoa).

Caesio erythrogaster Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 240, 1882 (New Guinea).

This species represents *Odontonectes*, having an outer enlarged row of conic teeth in each jaw besides villiform teeth on the vomer and palatines.

In the National Museum 2 from New Guinea.

East Indian region.

Caesio lunaris Cuvier.

Caesio lunaris (Ehrenberg) Cuvier: Hist. nat. Poiss., vol. 6, p. 332, 1830 (type loc., East Indies; Red Sea; New Ireland).—Günther: Cat. fishes Brit. Mus., vol. 1, p. 390, 1859 (Red Sea, Batavia or New Ireland?).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 262, 1883 (New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 6, no. 1, p. 45, 1906 (Shortland Island, Solomons).

Coesio lunaris Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 186, 1830 (Port Praslin, New Ireland).

Head 3 1/5; depth 2 2/3; D. X, 14, 1; A. III, 11, 1; scales 56 in lateral line to caudal base and 7 more on latter; 7 scales above lateral line, 15 below; 23 predorsal scales; snout 4 in head measured from upper jaw tip; eye 4; maxillary 3 1/10; interorbital 3 1/5. Least depth of caudal peduncle 3 in total head length. Head width 2 in its length. Fourth dorsal spine 2 in head; second dorsal ray 3 1/5; second anal spine 3 1/8; upper caudal lobe 1; pectoral 1+1/8; ventral 1 1/2. Caudal tips black, also pectoral axil and spot at base externally.

In the Bishop Museum 3 from Shortland Island, 152 to 193 mm.

Red Sea, Zanzibar, East Indies, Melanesia.

Caesio xanthonotus Bleeker.

Caesio xanthonotus Bleeker: Nat. Tijds. Ned. Ind., vol. 4, p. 466, 1853 (type loc., Batavia, Java).

Caesio teres Seale: B. P. Bishop Mus., Occ. Papers, vol. 6, no. 1, p. 44, fig. 13, 1906 (type loc., Shortland Island, Solomons, no. 1329).

Head 3 1/4; depth 3 1/5; D. X, 15, 1; A. III, 12, 1; scales 56 in lateral line to caudal base and 6 more on latter; 8 scales above lateral line, 16 below; 24 predorsal scales; snout 4 in head measured from upper jaw tip; eye 4; maxillary 3; interorbital 3 1/6. Least depth of caudal peduncle 4 in total head length. Head width 2 in its length. Snout conic, length 4/5 its width. Maxillary apparently not quite reaching pupil, little beyond front eye edge; expansion 2 1/2 in eye. Teeth fine, villiform, in narrow bands in jaws, on vomer, none on palatines. Preopercle edge cutaneous, with imbedded fine serrae. Gill rakers 11+24, lanceolate, slender, equal gill filaments or 1 3/5 in eye. Scales with 9 or 10 basal radiating striae; apical denticles 70 to 76, basal elements in 7 to 10 series; circuli fine. Cheek with 4 rows of scales to preopercle ridge. Unpaired fins all more or less scaly. Fourth dorsal spine 2 1/8 in total head length; first dorsal ray 3 2/5; second anal spine 3 1/8; upper caudal lobe 1; pectoral 1+1/10; ventral 1 3/5. Dusky-brown above, sides and below pale. Pectoral axil and base externally with black bar. Fins brownish, lower pale. Iris pale slaty. Length 184 mm.

The above notes from the type of *Caesio teres* Seale from Shortland Island, in the Bishop Museum.

According to Seale's note on the life colors his example is very close to Bleeker's description and figure of *Caesio xanthonotus* (Atlas ichth., vol. 8, p. 37, 1876-77; vol. 7, pl. [24], 302, fig. 1, 1873-76). The blue lateral band could well be evanescent.

East Indies, Melanesia.

Caesio pisang Bleeker.

Caesio pisang Bleeker: Nat. Tijds. Ned. Ind., vol. 4, p. 113, 1853 (type loc., Amboina; Batavia).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 240, 1882 (New Guinea).

Body and fins uniform rosy. Tip of each caudal lobe dusky.

East Indian region.

Caesio maculatus Cuvier.

Caesio maculatus Cuvier: Hist. nat. Poiss., vol. 6, p. 331, 1830 (type loc., Vanicolo).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 12, 1877 (Pelew Islands).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 122, 1913 (Majalibit Bay, Waigiu).

The present appears to have some characters in common with *Caesio xanthonotus* Bleeker. It appears to differ in color, as each caudal lobe is said to have a blackish longitudinal stripe and the greenish body is spotted with blue, but without a lateral band.

Madagascar, East Indies, China, Micronesia.

Caesio caerulaureus Lacépède.

Caesio caerulaureus Lacépède: Hist. nat. Poiss., vol. 5, pp. 85, 86, 1802 (type loc., Moluccas).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 6, no. 1, p. 44, 1906 (Shortland Island, Solomons).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 266, 1905 (1906) (Apia).—Pellegrin: Mus. Paris, Bull., vol. 18, p. 206, 1902 (Port Sandwich, New Hebrides).

Caesio coerulaureus Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 262, 1883 (Eastern New Guinea).

Coesio azuror Thiollière: Fauna Woodlark, p. 162, 1857 (Woodlark Island).

Coesio nori (Montrouzier) Thiollière: Fauna Woodlark, p. 162, 1857 (name in synonymy).

Head 3 1/3 to 3 2/5; depth 3 1/3 to 4 2/5; D. X, 14, 1 to 16, 1; A. III, 12, 1; scales 55 to 60 in lateral line to caudal base and 5 or 6 more on latter; 7 scales above lateral line, 14 below, 23 to 26 predorsal; snout 4 to 4 1/8 in head measured from upper jaw tip; eye 3 3/4 to 3 4/5; maxillary 2 7/8 to 3; interorbital 3 1/4 to 4.

Body fusiform, rather robust, but slightly compressed. Caudal peduncle well compressed, least depth 1 4/5 to 2 in its length or 3 2/3 to 3 4/5 in total head length. Head width 1 7/8 to 2 in its length. Snout conic, length 4/5 its width. Eye with hind pupil edge slightly before center in head length; diameter greater than snout, equals or greater than interorbital; adipose lid rather narrow, slightly wider behind. Mouth small, lower jaw slightly protruding. Maxillary reaches eye, expansion 2 3/4 to 3 in eye. Teeth minute, feeble, row in each jaw, none on tongue or on palate. Front nostril at last 2/5 in snout; hind nostril higher and close before front eye edge. Interorbital broadly convex. Gill rakers 10+27, finely lanceolate, equal gill filaments or 2 in eye. Scales with 10 to 12 basal radiating striae; apical denticles 66 to 69, basal elements in 12 or 13 transverse series; circuli fine. Third dorsal spine 2 to 2 1/2 in head; first dorsal ray 4 2/5 to 4 1/2; third anal spine 3 to 3 1/5; caudal 1 1/10 to 1 1/4; pectoral 1 1/8 to 1 1/2; ventral 1 4/5 to 2.

Back grayish, sides and below white. Fins all pale brown. Iris white. Length 134 to 138 mm.

In the Agassiz Museum 6 specimens from the Kingsmills, obtained by Andrew Garrett. Two in the Bishop Museum from Shortland Island, larger 178 mm. The National Museum has 3 from New Guinea and 5 from Apia.

Red Sea, Zanzibar, Mauritius, India, East Indies, Melanesia, Polynesia, Micronesia.

Caesio chrysozonus Cuvier.

Caesio chrysozona (Kuhl and Van Hasselt) Cuvier: Hist. nat. Poiss., vol. 6, p. 331, 1830 (type loc., East Indies).

Caesio chrysozonus Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 262, 1883 (Pitt Bay, New Guinea).

Differs from *Caesio caerulaureus* in that only the tips of the caudal lobes black and no black spot at pectoral origin.

India, East Indies, New Guinea.

Caesio argenteus (Bloch).

Bodianus argenteus Bloch: Nat. ausländischen Fische, pt. 4, p. 57, pl. 231, fig. 2, 1790 (type loc., "Mediterranean").

Caesio argenteus Cuvier: Hist. nat. Poiss., vol. 6, p. 329, 1830 (East Indies).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 33, pl. 24, fig. B, 1874 (Kingsmills).

Head 3 1/4; depth 4 1/2; D. X, 15; A. III, 12; scales 52+6 in lateral line, 4 above, 8 below; eye little greater than snout, 3 4/5 in head; maxillary not quite reaching front of eye; third dorsal spine 1 4/5 in head. Back bluish. Length 153 mm. (Günther)

Quite likely, as Günther suggests, *Caesio gymnopterus* Bleeker may be a synonym. According to Bleeker's figure (Atlas ichth., vol. 8, p. 34, pl. [32] 310, fig. 5, 1876-77) of *Gymnocaesio gymnopterus* it differs in showing the spinous dorsal with a much shorter base and the scales in the lateral line are given as 80.

Caesio tile Cuvier.

Caesio tile Cuvier: Hist. nat. Poiss., vol. 6, p. 322, 1830 (type loc., Caroline Archipelago).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 34, 1874 (Kingsmills; Society Islands).—Günther: Rept. voyage "Challenger," vol. 1, p. 58, 1880 (Tongatabu).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 114, 1912 (Mangareva, Gambier Islands).—Fowler: B. P. Bishop Mus., Bull. 22, p. 9, 1925 (Guam).

Coesio tile Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 181, 1830 (Caroline Islands).

Clupeolabrus dubius Nichols, Am. Mus. Novit., no. 94, p. 2, fig. 2, Oct. 19, 1923 (type loc., Kamako, Mangareva Island).

Head 3 3/5 to 3 3/4; depth 4 to 4 1/3; D. X, 21, 1 or 22, 1; A. III, 12, 1 or 13, 1; scales 70 or 71 in lateral line to caudal base and 6 more on latter; 7 scales above lateral line, 14 to 16 below, 27 predorsal; snout 3 2/3 to 4 in head measured from upper jaw tip; eye 3 3/4 to 4; maxillary 2 1/2 to 2 4/5; interorbital 3 2/5 to 3 3/4.

Body elongately fusiform, rather robust or but moderately compressed. Caudal peduncle compressed, least depth 1 1/2 to 1 3/4 in its length or 3 2/5 to 3 1/2 in total head length. Head width 1 7/8 to 2 in its length. Snout conic, length 7/8 to 1 in its width. Eye with hind pupil edge about midway in head length; diameter slightly greater than snout, equals interorbital; adipose-lid rather narrow, slightly wider behind. Mouth small, lower jaw protruding. Maxillary reaches eye; expansion 2 in eye. Teeth minute, in narrow

bands in jaws, on vomer. Nostrils well separated; front one near center in snout length; hind one above front eye edge. Interorbital broadly convex.

Gill rakers 8+21, finely and slenderly lanceolate, equal gill filaments or 1 3/4 in eye.

Scales with 10 to 14 basal radiating striae; apical denticles 36 to 65, with basal elements in 1 to 7 series; circuli moderate. Third dorsal spine 2 to 2 7/8 in head; first dorsal ray 3 1/3 to 3 3/5; second anal spine 2 3/5 to 3 1/10; first anal ray, 3 to 3 2/5; caudal 1 1/5 to 1 1/4, well forked; pectoral 1 1/5 to 1 1/2; ventral 1 3/4 to 2.

Back olive-brown, tinged bluish, and gray area close along dark color of back from behind eye to caudal base. Lower surface silvery-white. Iris whitish. Fins pale. Caudal with median portion of each lobe brownish. Dusky-brown spot at pectoral origin and in axil. Length 88 to 135 mm.

In the Agassiz Museum 5 from the Kingsmilis and 28 from the Society Islands, obtained by Andrew Garrett. Also 3 from Mangareva. In Bishop Museum 1 from Nukuhiva and 9 from Guam in 1923. In the National Museum 3 from Mangareva, obtained February 4, 1905.

Plectorhinchus crassispinus (Rüppell).

Diagramma crassispinum Rüppell: Neue Wirbelth., Fische, p. 125, pl. 30, fig. 4, 1835 (type loc., Djedda).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 238, 1882 (New Guinea).

Plectorhynchus crassispina Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).—Bleeker: Atlas ichth., vol. 8, p. 15, pl. (64) 342, fig. 1, 1876-77 (Waigiu).

Euelatichthys crassispinus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 268, 1905 (1906) (Apia).

Diagramma gibbosus Hombron and Jacquinot: Voyage "Astrolabe" et "Zeleé," Zool., vol. 3, p. 46, pl. 5, fig. 2, 1853 (type loc., Samoa).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 26, 1874 (Samoa).

Diagramma crassilabre Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 271, pl. 5, fig. 5, 1876 (type loc., Hall Sound, New Guinea).

Diagramma unicolor Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 261, 1883 (type loc., China Straits, New Guinea).

Scales 62 to 65 along above lateral line, 50 to 52 along below lateral line. Caudal rounded or truncate. Uniform brownish-gray to dusky. Reaches 510 mm.

Three in the National Museum from Apia.

Jouan describes it as *Holocentrum,* No. 72, from Kanala, New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 289, 1861). His specimen 120 mm. Said to be brownish with oblique, diffuse, black bars. Fins black, with rose. Soft dorsal bordered with rose. Caudal flesh color, contrasted with black tail.

Red Sea, Zanzibar, Seychelles, India, East Indies, Queensland, Melanesia, Polynesia.

Plectorhinchus albovittatus (Rüppell).

Diagramma albovittatum Rüppell: Neue Wirbelth. Fische, p. 125, pl. 31, fig. 2, 1835 (type loc., Massaua, Red Sea).

Head 3 1/10; depth 2 1/2; D. XIII, 18, 1; A. III, 7, 1; scales 70 counted along lateral line to caudal base and 12 more on latter; tubes 58 in lateral line to caudal base and 9 more on latter; 11 scales above lateral line, 19 below, 50 predorsal; snout 2 2/3 in head; eye 3 1/2; maxillary 3 1/6; interorbital 4 1/2.

Body well compressed, oblong-ovate, deepest at middle of spinous dorsal, predorsal trenchant. Caudal peduncle well compressed, length 7/8 its least depth, which 2 1/2 in head. Head width 2 1/10 in its length. Snout compressed, profile slightly convex, width 1 1/3 in its length. Eye elevated, hind pupil edge midway in head length; diameter 1 1/4 in snout, greater than interorbital. Mouth small, little inclined from horizontal; jaws even. Maxillary reaches opposite front eye edge; expansion 2 2/5 in eye. Lips fleshy, moderately wide, finely papillose. Teeth fine, in narrow bands in jaws, outer series in each little enlarged; no teeth on tongue or palate. Front nostril at last 2/5 in snout; hind nostril higher, opposite middle of eye and closer to eye than front nostril. Interorbital broadly convex. Hind preopercle edge finely serrate. Gill rakers 10+21, lanceolate, 1/3 of gill filaments, which 1 2/3 in eye. Scales with 6 basal radiating striae with 3 or 4 incomplete auxiliaries; 33 to 38 apical denticles, with 6 or 7 transverse series of basal elements; circuli fine. Fourth dorsal spine 2 1/3 in head; twelfth dorsal ray 1 3/5; second anal spine 2; second anal ray 1 1/2; caudal 1 1/8, rounded behind; pectoral 1 2/5; ventral 1 1/3.

Pale brown generally. Dark median predorsal streak from occiput to spinous dorsal origin. Broad dark brown band from snout above eye and then back across soft dorsal over its posterior half, parallel above broad dark brown margin. From side of snout to eye dark brown band through eye, then broadening along median body axis to caudal base, also extended out on lower half of caudal and forking behind. Upper half of caudal with 2 longitudinal parallel dusky-brown bands. Lower half of anal dusky-brown. Pectoral and ventral whitish. Length 105 mm.

In the Agassiz Museum 1 from Marshall Islands obtained by the Rev. R. W. Wood, April 15, 1876. Agrees with Bleeker's figure (Atlas ichth., vol. 8, pl. [51] 329, fig. 2, 1876-77), except that the second pale bluish band begins on the upper surface of the snout before the eye.

Red Sea, India, East Indies, Micronesia.

Plectorhinchus chaetodonoides Lacépède.

Plectorhinchus chaetodonoides Lacépède: Hist. nat. Poiss., vol. 3, pp. 134, 135, 1802 (no type locality); op. cit., vol. 2, pl. 13, fig. 2 (1800).

Plectorhynchus chaetodonoides Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 267, 1905 (1906) (Apia).

Diagramma montrouzieri Thiollière: Fauna Woodlark, p. 156, 1857 (type loc., Woodlark Island).

Diagramma punctatissimum Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 27, pl. 21, 1874 (Society Islands).

Diagramma papuense Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 237, 1882 (type loc., New Guinea).

Diagramma pardale Günther: Rept. voyage "Challenger," vol. 1, p. 34, 1880 (Ovalau, Fiji).

Diagramma pardalis Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 260, 1883 (China Straits, New Guinea).

Similar to *Plectorhinchus albovittatus* in squamation. With age, body and fins except pectorals, breast and belly, covered with thick-set dark spots, none larger than pupil.

East Indies, China, Melanesia, Polynesia.

Plectorhinchus celebicus Bleeker.

Plectorhynchus celebicus Bleeker: Nederlandsch Tijds. Dierk., 4, p. 285, 1873 (type loc., Macassar).

Diagramma celebicum Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 238, 1882 (New Guinea).

Differs from *Plectorhinchus lineatus* in blue-gray color

with 8 longitudinal golden bands, only median extending on base of caudal. (Bleeker)

East Indian region.

Plectorhinchus lineatus (Linné).

Perca lineata Linné: Systema nat., 10th ed., p. 293, 1758 (habitat of type?).

Head 3 1/6; depth 2 3/5; D. XIII, 19, 1; A. III, 7, 1; scales 92 in lateral line to caudal base; tubes 56 in lateral line to caudal base and 8 more on latter; 15 scales above lateral line to spinous dorsal origin, 20 below; 55 predorsal scales: snout 2 4/5 in head; eye 3 1/3; maxillary 3 1/8; interorbital 4 1/5.

Body well compressed, oblong ovate, deepest at middle of spinous dorsal. Caudal peduncle well compressed, long as deep, least depth 2 2/3 in head. Head width 1 7/8 in its length. Snout rather obtuse, convex over surface and slightly so in profile, width equals its length. Eye elevated, hind pupil edge midway in head length; diameter 1 1/5 in snout, greater than interorbital. Mouth small, little inclined from horizontal, jaws even. Lips fleshy, finely papillose. Teeth simple, conic, in moderate bands, villiform, outer series in each jaw slightly enlarged. Nostrils together, front one at last third in snout, hind one close behind. Interorbital broadly convex. Hind preopercle edge finely denticulate. Gill rakers 11+18, lanceolate, 2 1/2 in gill filaments, which 1 2/5 in eye. Scales with 5 or 6 basal radiating striae, 2 auxiliaries; apical denticles 39 to 42, with 9 or 10 transverse series of basal elements; circuli fine. Fourth dorsal spine 2 1/5 in head; fourteenth dorsal ray 1 1/3; second anal spine 1 3/4; fourth anal ray 1 1/2; caudal rounded convexly behind, 1 1/6; pectoral 1 1/4; ventral 1 1/4.

Pale brown generally. Side with 6 longitudinal deep brown bands; uppermost from each side of occiput to base of soft dorsal; second from above eye to hind base of soft dorsal; third from side of snout to eye, then over postocular to upper edge of caudal peduncle; fourth from side of snout tip, close above pectoral origin, then to lower half of caudal base; fifth from end of maxillary to pectoral base and then to lower caudal peduncle edge; sixth along lower side of cheek to anal base. Fins all pale, edge and base of spinous dorsal deep brown, though dark longitudinal bands extending out on soft fin. Caudal with 3 narrow dusky-brown oblique lines, approximating behind. Anal largely whitish, soft fin with 4 or 5 dark blotches. Pectoral with 2 dark brown blotches. Ventral whitish. Length 132 mm.

In the Agassiz Museum 1 from the Marshall Islands, obtained by Rev. R. W. Wood, April 15, 1876. This specimen is marked very much as in Bleeker's figure (Atlas ichth., vol. 7, pl. [28] 306, fig. 4, 1876-77), except that both dorsals are entirely margined above with deep brown and there are but 2 oblique dark bands approximating on each caudal lobe.

Plectorhinchus diagramma (Linné).

Perca diagramma Linné: Systema Nat., 10th ed., p. 293, 1758 (Habitat of type?).

Plectorhynchus diagramma Jordan and Seale, (U. S.) Bur. Fish., Bull., vol. 25, p. 267, 1905 (1906) (Apia; Pago Pago).

Plectorhinchus digramma Fowler: B. P. Bishop Mus., Bull. 22, p. 9, 1925 (Guam).

Diagramma lessonii Cuvier: Hist. nat. Poiss., vol. 5, p. 234, 1830 (type loc., Waigiu).—Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 199, pl. 24, 1830 (Offack Bay, Waigiu).—Günther: Cruise of "Curacoa," p. 409, 1873 (Solomons).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 23, 1874 (Samoa).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 28, pl. 23, 1874 (Samoa).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 260, 1883 (Hood Bay, New Guinea).

Plectorhynchus lessoni Bleeker: Atlas ichth., vol. 8, p. 19, pl. (39) 317, fig. 3, 1876-77 (Waigiu).

Diagramma vavad Thiollière: Fauna Woodlark, p. 158, 1857 (type loc., Woodlark Island).

Head 3 1/3; depth 2 7/8; D. XIII, 18, 1; A. III, 7, 1; tubes 63 in lateral line to caudal base and 8 more on latter; scales 95 in lateral line to caudal base, 13 above, 21 below, 51 predorsal; snout 2 2/3 in head; eye 4 1/3; maxillary 2 2/3; interorbital 3 3/4.

Body oblong, well compressed, deepest at ventral origin. Caudal peduncle well compressed, least depth 1 2/5 its length or 2 4/5 in head. Head width 1 7/8 its length. Snout obtusely convex, long as wide. Eye elevated, hind edge slightly behind middle in head length; 1 3/5 in snout, 1 1/10 in interorbital. Mouth large, jaws strong, even. Lips thick, fleshy, coriaceous. Maxillary reaches slightly beyond front of eye, not quite to pupil; expansion 1 3/5 in eye. Teeth conic, in bands in jaws, with outer row of strong, even, enlarged ones and 4 or 5 irregular inner series of which posterior or innermost smaller. Chin with 3 pores each side. Nostrils alike, together, less than half an eye diameter before eye front. Interorbital convex. Preopercle with hind edge finely serrate. Gill rakers 11+22, lanceolate, 1/2 of gill filaments, which 1 1/3 in eye. Scales in oblique series above and below lateral line, fine and crowded on bases of all fins, largely over caudal. Muzzle and front of interorbital naked. Scales with 3 to 5 basal radiating striae; apical denticles 60 to 86, basal elements in 18 to 26 transverse series; circuli fine. Third dorsal spine 2 1/10 in head, third ray 3 1/3; second anal spine 2 2/5, second ray 2 1/10; caudal 1 1/4, slightly emarginate; pectoral 1 2/5; ventral 1 2/5.

Body white generally, with 8 neutral-black longitudinal bands, lower 4 narrow progressively below. Iris golden. Spinous dorsal broadly blackish marginally and with basal row of dark spots. Soft dorsal with narrow black margin and median row of black spots. Caudal with 4 transverse rows of black spots, anal with 2. Paired fins pale. Length 40 to 406 mm.

The Bishop Museum has 5 specimens obtained at Guam in 1923. One in the National Museum from Apia.

Diagramma vavad Thiollière is likely a synonym, of which the following brief items may be gathered from the description: Each side with 8 blackish or dusky longitudinal bands, with bluish ground-color. Red mark at mouth corner and another at pectoral origin. Fins and snout yellow. Some black spots on dorsals and anals, also caudal, dorsal border blackish.

East Africa, East Indies, Melanesia, Polynesia.

Plectorhinchus radja (Bleeker).

Diagramma radja Bleeker: Nat. Tijds. Ned. Ind., vol. 5, p. 336, 1853 (type loc., Amboina).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 261, 1883 (Hood Bay, New Guinea).

Three superior bands of the body curve down and forward on head. Otherwise like the next 4 species in having 100 scales along above lateral line. (Bleeker)

East Indian region.

Plectorhinchus cuvier (Bennett).

Bodian cuvier Bennett: Fishes of Ceylon, pl. 13, 1828 (type loc., Ceylon).

Diagramma sebae Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 2, 1859 (Doreh, New Guinea).

Like *P. radja* in having but 80 scales along below lateral line. All bands on head and body horizontal. (Bleeker)

Zanzibar, East Indies, Melanesia.

Plectorhinchus goldmanni (Bleeker).

Diagramma goldmanni Bleeker: Nat. Tijds. Ned. Ind., vol. 4, p. 602, 1853 (type loc., Ternate).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 237, 1882 (New Guinea).

Diagramma haematochir Bleeker: Nat. Tijds. Ned. Ind., vol. 6, p. 175, 1854 (type loc., Ternate).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 261, 1883 (Hood Bay, New Guinea).

This and the next 2 species with 85 scales along below lateral line. It differs in having 44 scales between lateral line and anal. Black lateral bands 8 to 18. Vertical fins spotted with black. Pectoral with black basal spot. (Bleeker)

East Indian region.

Plectorhinchus orientalis (Bloch).

Anthias orientalis Bloch: Nat. ausländischen Fische, pt. 7, p. 10, pl. 326, fig. 3, 1793 (type loc., Japan).

Diagramma orientale Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 28, pl. 22, figs. B-C, 1874 (Samoa).

Diagramma pica Cuvier: Hist. nat., Poiss., vol. 5, p. 222, 1830 (type loc., Tahiti).—Günther: op. cit., p. 27, pl. 22, fig. A, 1874 (Fiji).

Percoides pica (Parkinson) Cuvier: Hist. nat. Poiss., vol. 5, p. 222, 1830 (name in text).

Like the next species with but 37 or 38 scales between lateral line and anal origin. Young with large round pearly spots, changing with age into irregular bands. Vertical fins and pectorals bordered yellowish or white. Large black or brown subocular blotch. (Bleeker)

Ceylon, East Indies, Polynesia.

Plectorhinchus polytaenia (Bleeker).

Diagramma polytaenia Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 755, 1852 (type loc., Macassar).

Diagramma polytaenla Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 261, 1883 (China Straits, New Guinea).

Diagramma ouan Thiollière: Fauna Woodlark, p. 157, 1857 (type loc., Woodlark Island).

Reddish-brown with 5 to 9 pearly bands edged dusky. Fins yellowish, vertical banded brown in young. (Bleeker)

Possibly *Diagramma ouan* may have been intended for this species. It is described as gray blue, with 7 longitudinal yellow bands, intermediate interrupted, red inside mouth and fins yellow. The body is said to be fusiform, 3 times more long than high without caudal and the latter bilobed.

East Indian region.

Plectorhinchus schotaf (Forskål).

Sciaena abu-mgaterin schotaf Forskål: Descriptiones animalium, p. 51, 1775 (type loc., Arabia).

Holocentrus schotaf Schneider: Systema ichth., Bloch, p. 320, 1801 (on Forskål).

Diagramma kumut Thiollière: Fauna Woodlark, p. 158, 1857 (type loc., Woodlark Island).

Diagramma obscurum Günther: Zool. Soc. London, Proc., p. 657, pl. 58, 1871 (type loc., Fiji).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 23, 1874 (Viti Islands).

Diagramma giganteum Günther: Ann. Mag. Nat. Hist. London, 5th ser., vol. 4, p. 136, 1879 (type loc., Ponapé).

Head 2 4/5 to 3 1/2; depth 2 2/3 to 2 3/4; D. XII or XIII, 17 to 19; A. III, 7; scales 75 to 85 in lateral line, 13 above, 24 below; maxillary to eye, shorter with age; eye 3 2/3 in head, long as snout, in small examples; caudal emarginate. Uniform brownish-black, little lighter below. Reaches 915 mm. (Günther)

Diagramma kumut may be intended for this species. The few fragmentary items given by Thiollière are chiefly as follows: D. XII, 17, fifth and sixth spines longest, not notched; A. III, 7 or 8; scales large, cover soft dorsal. Snout very short, eye little larger. Upper profile convex. Caudal forked. All black, abdomen reddish. Mouth red.

Evidently *Diagramma griseum* Cuvier (Hist. nat. Poiss., vol. 5, p. 229, 1830, type loc., Malabar) is snyonymous with *Sciaena abumgaterin schotaf* Forskål, likewise *Diagramma sordidum* Klunzinger.

Red Sea, Seychelles, India, Melanesia, Polynesia.

Plectorhinchus pictus (Thunberg).

Perca picta Thunberg: Kong. Vet. Akad. Handl. Stockholm, vol. 13, p. 143, 1792 (type loc., Abbor, Slogtet).

Diagramma pictum Günther: Rept. voyage "Challenger," vol. 1, p. 34, 1880 (Ovalau, Fiji).

Diagramma punctatum (Ehrenberg) Cuvier: Hist. nat. Poiss., vol. 5, p. 226, 1830 (Java; Batavia; Vanicolo).—Quoy and Gaimard: Voyage "Astrolabe," Zool., vol. 3, p. 699, pl. 12, fig. 2, 1834 (Vanikoro).—Thiollière: Fauna Woodlark, p. 157, 1857 (Woodlark Island).—Peters: Akad. Wiss. Berlin, Monatsb., p. 832, 1876 (1877) (New Guinea).

Diagramma moaiab (Montrouzier) Thiollière: Fauna Woodlark, p. 157, 1857 (name in synonymy).

Diagramma centurio Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 238, 1882 (New Guinea).

Scales 122 to 125 along above lateral line; 100 along below lateral line. Young with 4 to 6 dusky lateral bands, becoming brown spotted except on paired fins and anal. (Bleeker)

One in the Agassiz Museum from the Society Islands, obtained by Andrew Garrett, 445 mm. long.

Jouan describes it as *Pristipoma* No. 68 from Port de France, New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 285, 1861): D. XII, 15; A. III, 8. Greenish-gray, strewn with golden dots, fading at death. Flanks silvery, with dark longitudinal lines. Length 500 mm.

His next description, or *Pristipoma* No. 69, is evidently the young (op. cit., p. 286). Also from Port de France: D. X, 23; A. III, 6. Caudal rounded. Gray, with 3 wide longitudinal black bands and narrower intermediate ones. Yellow and black on dorsal and caudal. Anal and ventral black. Length little over 90 mm.

Red Sea, Zanzibar, Seychelles, India, East Indies, China, Japan, Melanesia, Micronesia.

Pomadasis maculatus (Bloch).

Anthias maculatus Bloch: Nat. ausländischen Fische, pt. 7, p. 9, pl. 32, fig. 2, 1793 (type loc., East Indies).

Pristipoma maculatum Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).

Pomadasys maculatus Bleeker: Atlas ichth., vol. 8, p. 27, pl. (30) 306, fig. 2, 1876-77 (Waigiu).

Above lateral line 5 or 6 scales, 12 or 13 below. Second anal spine less than double eye diameter. Back

with few large brown spots. Spinous dorsal with large brown blotch. Length 182 mm. (Bleeker)

Red Sea, East Africa, India, East Indies, Queensland.

Pomadasis hasta (Bloch).

Lutjanus hasta Bloch: Nat. ausländischen Fische, pt. 4, p. 109, pl. 246, fig. 1, 1790 (type loc., Japan).

Pristipoma hasta Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).—Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 270, 1876 (Hall Sound, New Guinea).—Peters: Akad. Wiss. Berlin, Monatsb., p. 832, 1876 (1877) (New Britain).—Bleeker: Atlas ichth., vol. 8, p. 28, pl. (47) 325, fig. 3, 1876-77 (Waigiu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 237, 1882 (New Guinea).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 14, 1885 (Rubi, New Guinea).

Above lateral line 4 or 5 scales, 13 or 14 below. Second anal spine double or more eye-diameters. Dorsal and upper surface of body with small brown spots in longitudinal rows. Length 245 mm. (Bleeker)

Two from New Guinea in the National Museum, 197 and 222 mm.

Red Sea, East Africa, Madagascar, India, East Indies, China, Queensland, Melanesia.

Pomadasis grunniens (Schneider).

Anthias grunniens Schneider: Systema ichth., Bloch, p. 308, 1801 (type loc., Tanna Island).

Perca grunniens Lichtenstein: Descriptiones animalium, Forster, p. 294, 1844 (Tanna).

Pristipoma argyreum Hase, Jena. Zeitsch. Nat., 51, 1914, p. 528, fig. 1 (Tami, Kaiser-Wilhelms-Land, New Guinea).

Differs from the preceding species in scales 42 or 43 in lateral line (compared with 46 to 49). Body uniform or without spots. Length 198 mm. (Bleeker)

India, East Indies, Melanesia.

Scolopsis margaritifer (Cuvier).

Scolopsides margaritifer Cuvier: Hist. nat. Poiss., vol. 5, p. 254, 1830 (type loc., Waigiu).—Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 98, 1830 (Offack Bay, Waigiu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 238, 1882 (New Guinea).

Scolopsis margaritifer Bleeker: Atlas ichth., vol. 8, p. 3, pl. (39) 317, fig. 2, 1876-77 (Waigiu).

Scolopsis macrophthalmus Ramsay and Ogilby: Linn. Soc. New South Wales, Proc., 2nd ser., vol. 1, p. 10, 1886 (type loc., Port Moresby, New Guinea).

Depth 2 1/2 to 2 4/5; preorbital spine strong; cheek with 4 rows of scales, 4 rows above lateral line, which has 38 or 39; predorsal scales extend before front of eyes; body scales each with pearly or yellow spot. Length 250 mm. (Bleeker)

Scolopsis macrophthalmus was based on a specimen 216 mm. long, evidently the present species.

East Indian region.

Scolopsis leucotaenia (Bleeker).

Scolopsides leucotaenia Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 451, 1852 (type loc., Banka or Lepar Island).

Depth 3; no preorbital spine; cheek with 4 or 5 rows of scales, 4 rows above lateral line, which has 37 or 38; predorsal scales not extending forward to front of eyes; white band from upper half of eye to caudal, bordered above and below with black band; black blotch on front of spinous dorsal. (Bleeker)

One in the National Museum from New Guinea, 133 mm.

India, East Indies.

Scolopsis trilineatus Kner.

Scolopsis trilineatus Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, pp. 27, 30, pl. 2, fig. 5, 1868 (type loc., Savay, Samoa).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Savay).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 31, pl. 25, fig. A, 1874 (Samoa; Fiji).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 239, 1882 (New Guinea).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1385, 1906 (Upolu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 33, 1925 (Samoa).

Scolopsis trilineata Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 45, 1906 (Faté, New Hebrides).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 268, 1905 (1906) (Apia; Pago Pago).

Head 3 1/6; depth 3 1/6; D. X, 9, 1; A. III, 7, 1; scales 41 in lateral line to caudal base and 3 more on latter; 4 scales above lateral line, 10 below; 22 predorsal scales; snout 3 in head; eye 3 1/6; maxillary 3 1/4; interorbital 2 2/3. Least depth of caudal peduncle 2 2/5 in head. Head width 1 5/6 in its length. Fourth dorsal spine 2 1/5 in head; third dorsal ray 2 1/8; third anal spine 2 1/2; second anal ray 2 1/5; caudal 1 1/8; pectoral 1 2/5; ventral 1 1/3.

Three in the Bishop Museum from Faté, largest 190 mm. Four in the National Museum from Apia. Five in the Agassiz Museum from Apia.

East Indies, Melanesia, Polynesia.

Scolopsis cancellatus (Cuvier).

Scolopsides cancellatus Cuvier: Hist. nat. Poiss., vol. 5, p. 264, 1830 (type loc., Hawaiian islands; Waigiu; Rawac; Vanicolo; Ulea).

Scolopsis cancellatus Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1864 (Samoa).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 30, 1874 (all Polynesia).—Bleeker: Atlas ichth., vol. 8, p. 5, pl. (31) 309, fig. 2, 1876-77 (Waigiu).—Peters: Akad. Wiss. Berlin, Monatsb., p. 832, 1876 (1877) (New Hannover).—Fowler: B. P. Bishop Mus., Bull. 22, p. 9, 1925 (Guam).

Scolopsis lineatus Quoy and Gaimard: Voyage "Uranie," Zool., p. 322, pl. 60, fig. 3, 1824 (type loc., Waigiu).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 31, 1874 (Samoa).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 65, 1900 (Guam).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1384, 1906 (Upolu).

Scolopsis bleekeri Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Pelew Islands).—Schmeltz: op. cit., Cat. 5, p. 23, 1874 (Pelew Islands; Samoa).

Scolopsis trilineatus (non Quoy and Gaimard) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 45, 1906 (Faté, New Hebrides).

Distinguished by the presence of 2 or 3 silvery or yellowish longitudinal bands extending horizontally back from eye.

Three from Faté and 4 from Agaña, Guam, in the Bishop Museum. The two largest Agaña specimens do not have the black blotch on the front of the spinous dorsal, which present in all the others. The Faté specimens agree with Bleeker's figure of *Scolopsis bleekeri* Günther (Atlas ichth., vol. 7, pl. [16] 294, fig. 1, 1873-76). Also 3 from Guam in 1923. In the Agassiz Museum 1 from Meos Boendi, Wiak Island, New Guinea, from Thomas Barbour, 1 from

Paanopa in the Gilberts from Rev. L. H. Gulick and 3 from Ascension Island in the Marshall Islands from Rev. A. A. Strong on April 14, 1877.

Andamans, East Indies, Melanesia, Micronesia, Polynesia.

Scolopsis elongatus Weber.

Scolopsis elongatus Weber: Siboga Exp., vol. 67, p. 281, fig. 67, 1913 (type loc., Elat, High Key).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 122, 1913 (Saonek, Waigiu).

Head 3 1/8; depth 3 3/4; D. X, 9; A. III, 8; scales 42, above 3, below 12; snout 4 in head; eye 2 4/5; maxillary 3 1/5. Cheek scales in 4 rows to preopercle ridge. Brown. Dark band from interorbital close along first dorsal base; second broader, from upper eye edge to upper front of caudal peduncle; third broadest, from hind eye edge to upper caudal ray bases; fourth from lower eye edge narrow, reaches gill opening and continued from inner pectoral base to bases of lower caudal rays; also dark line from lower base of pectoral to front of lower edge of caudal peduncle; dark bar across pectoral base. Length 55 mm. (Weber)

Scolopsis ciliatus (Lacépède).

Holocentrus ciliatus Lacépède: Hist. nat. Poiss., vol. 4, pp. 333, 367, 1802 (no locality).

Scolopsis ciliatus Bleeker: Atlas ichth., vol. 8, p. 6, pl. (38) 316, fig. 2, 1876-77 (New Guinea).

Scolopsides lycogenis Cuvier: Hist. nat. Poiss., vol. 5, p. 261, pl. 127, 1830 (type loc., Java; New Guinea; Vanicolo).

Lycogenis argyrosoma (Kuhl and Van Hasselt) Cuvier: Hist. nat. Poiss., vol. 5, p. 261, 1830 (name in synonymy).

Scolopsides lerol Thiollière: Fauna Woodlark Island, p. 159, 1857 (type loc., Woodlark Island).

Scolopsis lineatus (non Quoy and Gaimard) Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 239, 1882 (New Guinea).

Depth 2 4/5 to 3; preorbital spine small; cheek with 4 rows of scales, 4 rows above lateral line, which has 43 or 44; predorsal scales not extending forward to front of eyes; brownish, with longitudinal pearl-white band along upper edge of back. Length 185 mm. (Bleeker)

One from New Guinea in the National Museum.

Evidently the notice from Thiollière pertains to this species. It is said to be without suborbital spine, and the other differences are likely simply minor variants.

Andamans, East Indies, Melanesia.

Scolopsis bilineatus (Bloch).

Anthias bilineatus Bloch: Nat. ausländischen Fische, pt. 7, p. 3, pl. 325, fig. 1, 1793 (type loc., Japan).

Scolopsides bilineatus Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).

Scolopsis bilineatus Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, p. 302, 1868 (Kandavu, Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Kandavu, Fiji).—Günther: Cruise of "Curaçoa," p. 409, 1873 (Solomons).—Bleeker: Atlas ichth., vol. 8, p. 7, pl. (64) 342, fig. 1, 1876-77 (Waigiu; New Guinea).—Günther; Rept. voyage "Challenger," vol. 1, p. 34, 1880 (Ovalau, Fiji).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 239, 1882 (New Guinea).—Weber: Zool. Forsch. Australien (Semon), vol. 5, p. (103) 263, 1895 (coast of New Guinea).

Scolopsis bilineata Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 45, 1906 (Shortland Island).

Head 3 1/4; depth 2 1/2; D. X, 9, 1; A. III, 7, 1; scales 45 in lateral line to caudal base and 4 more on latter; 5 scales above lateral line, 10 below; 30 predorsal; snout 3 in head; eye 3; maxillary 3 2/5; interorbital 3. Least depth of caudal peduncle 2 1/3 in head. Head width 1 3/4 in its length. Snout conic, pointed, length 7/8 its width. Maxillary reaches eye. Preopercle edge denticulate. Small antrorse spine immediately below eye and above large infraorbital spine. Gill rakers 4+5, low broad tubercles, greatly shorter than gill filaments, which 3 in eye. Scales with 11 basal radiating striae; apical denticles 127 to 132, basal elements in 1 or 2 rows; circuli fine. Fifth dorsal spine 2 1/4 in head; sixth dorsal ray 1 1/2; second anal spine 2; third anal ray 1 1/2; caudal 1; pectoral 1; ventral 1.

Dull olivaceous generally, slightly paler below. Pale band from maxillary just above pectoral base to front of soft dorsal, narrowing behind and bordered by dusky line above and below. Fins brownish. Upper front half of soft dorsal, all of spinous anal and first 2/5 of soft anal black. Iris dull slaty-brown. Length 183 mm.

One in the Bishop Museum from Shortland Island. Two in the National Museum from New Guinea, 167 mm.

Andamans, East Indies, Melanesia, Polynesia.

Scolopsis personatus (Cuvier).

Scolopsides personatus Cuvier: Hist. nat. Poiss., vol. 5, p. 259, 1830 (type loc., Batavia).

Scolopsis personatus Bleeker: Atlas ichth. Ind. Néerland., vol. 8, p. 9, pl. (63) 341, fig. 4, 1877. Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).

Depth 3; preorbital spine small; cheek with 5 rows of scales, 4 rows above lateral line, which has 46 to 48; predorsal scales not reaching front of eyes; median lateral pale yellow band; bluish interocular band. Length 260 mm. (Bleeker)

Evidently *Scolopsides caninus* is not the present species. It is based on an example 187 mm. long, grayish-green, with a yellow lateral band from the opercle nearly to the end of the caudal and with reddish-brown fins.

East Indian region.

Scolopsis monogramma (Cuvier).

Scolopsides monogramma (Kuhl and Van Hasselt) Cuvier: Hist. nat. Poiss., vol. 5, p. 254, 1830 (type loc., Java; Batavia).

Scolopsis monogramma Schmeltz: Mus. Godeffroy, Cat. 6, p. 12, 1877 (Pelew Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 239, 1882 (New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, 1906, p. 45 (Faté, New Hebrides).

Scolopsis trilineata (non Quoy and Gaimard) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 45, 1906 (Faté; part).

Head 3 1/8; depth 2 2/3; D. X, 9, 1; A. III, 5, 1; scales 42 in lateral line to caudal base and 3 more on latter; 4 scales above lateral line, 11 below; 25 predorsal scales; snout 3 1/3 in head from upper jaw tip; eye 3; maxillary 3 1/3; interorbital 3 1/3. Least depth of caudal peduncle 2 3/4 in head; head width 1 4/5; fourth dorsal spine 2 1/8; second dorsal ray 2 1/4; second anal spine 2 1/10; first anal ray 2 1/4; caudal 1 1/4; pectoral 1 1/4; ventral 1 2/5.

In the Bishop Museum, 3 from Faté, 203 to 234 mm. long. The National Museum has 4 from Fiji and 1 without locality, obtained by the Wilkes Expedition.

Color largely uniform olivaceous, with pale or yellow interocular band.

East Indies, Melanesia, Micronesia, Polynesia.

Scolopsis ghanam (Forskål).

Sciaena ghanam Forskål: Descriptiones animalium, pp. 12, 50, 1775 (type loc., Djedda; Lohaja).

Scolopsis (Scolopsides) ghanam Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Savay).

Scolopsides burukuarem Thiollière: Fauna Woodlark, p. 159, 1857 (type loc., Woodlark Island).

Depth 2 2/3; preorbital spine strong; cheek with 6 rows of scales, 4 rows above lateral line, which has 46; olive, yellowish-white band from snout to bases of dorsal spines, second from above eye to end of base of dorsal, third from snout passes through eye above bifurcating at shoulder, fourth along preorbital and suborbitals till above pectoral base; most scales below lateral line with black basal spot; black spot above pectoral base and violet mark at base of each caudal lobe. Length 170 mm. (Day)

Red Sea, Melanesia, Polynesia.

Scolopsis bimaculatus Rüppell.

Scolopsis bimaculatus Rüppell: Atlas Reis. Nord. Afrika, Fische, p. 8, pl. 2, fig. 2, 1828 (type loc., Massaua).

Scolopsis affinis Peters: Akad. Wiss. Berlin, Monatsb., p. 832, 1876 (1877) (type loc., Carteret Harbor, New Ireland; New Britain).

Depth 2 to 3; preorbital spine strong; cheek with 6 rows of scales, 5 rows above lateral line, which has 47 or 48; predorsal scales extend forward to front of eyes; dark median lateral band, often expanded with median large dark blotch and another at front of caudal peduncle. Length 301 mm. (Bleeker)

Scolopsis affinis is compared by Peters with *S. bimaculatus* and distinguished apparently by the absence of the dark lateral band and blotch, apparently only a variant.

Red Sea, Zanzibar, Mozambique, India, East Indies, China, Melanesia.

Scolopsis temporalis (Cuvier).

Scolopsides temporalis Cuvier: Hist. nat. Poiss., vol. 5, p. 257, 1830 (type loc., East Indies; Waigiu; New Guinea; Vanicolo).—Lesson: Voyage "Coquille," Zool., 2nd ser., vol. 1, p. 197, pl. 26, 1830 (Offack Bay, Waigiu).

Scolopsis temporalis Günther: Cat. fishes Brit. Mus., vol. 1, p. 360, 1859 (Louisiades in 15 fathoms).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Kandavu, Fiji).—Günther: Rept. voyage "Challenger," vol. 1, p. 34, 1880 (Kandavu, Fiji).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 45, 1906 (Shortland Island).

Scolopsis teemporalis Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 239, 1882 (New Guinea).

Head 3 1/6; depth 2 3/4; D. X, 9, 1; A. III, 7, 1; P. 1, 17; V. I, 5; tubular scales 48 in lateral line to caudal base and 1 more on latter; 6 scales above lateral line and 14 below; 29 predorsal scales; snout 2 2/5 in head; eye 4 1/4; maxillary 2 7/8; interorbital 2 7/8.

Body ovoid, deepest at middle of depressed ventral, edges all convex, well compressed. Caudal peduncle compressed, least depth 1 2/3 its length or 3 in head. Head pointed in profile, compressed, flattened sides slightly approximated above, width 1 9/10 its length. Snout conic, long as wide. Eye elevated, center about midway in head length. Mouth moderate, but little inclined, lower jaw slightly included. Maxillary reaches far as hind nostril; expansion 2 2/3 in eye. Lips firm, rather fleshy. Teeth simple, conic, fine, in bands in jaws; none on palate. Tongue rather small, pointed, surface smooth, end free. Nostrils small, close together, simple pores at last fifth in snout. Interorbital evenly convex. Preorbital wide as eye, with strong spine close to eye half diameter of same and edge below denticulate. Preopercle edge strongly denticulate behind, lower edge entire. Opercular spine small.

Gill opening extends forward opposite hind pupil edge. Gill rakers 1 + 6 low tubercles, 2 in gill filaments, which 2 in eye. Pseudobranchiae long as gill filaments. Isthmus constricted, narrow forward.

Scales with 12 to 14 basal radiating striae; apical denticles 200 to 202, basal elements in about 12 series; circuli very fine. Scales above lateral line in series parallel with its course; below in series slightly inclined upward posteriorly. Caudal largely covered with small scales, also pectoral base. Scales in 8 rows on cheek to angle of preopercle ridge. Lateral line arched toward spinous dorsal, drops little above middle along side of caudal peduncle to caudal base medianly; tubes slender, simple to slightly bifid.

Dorsal spines slender, pungent, fifth longest with others but little shorter and mostly uniform, fin origin opposite that of pectoral; fifth dorsal spine 3 in head. Soft dorsal inserted midway between upper edge of gill opening and caudal base, rays graduated down to last, which forms point depressible 3/4 to caudal base; sixth dorsal ray 1 7/8 in head. Spinous anal inserted about opposite soft dorsal origin, slender spines graduated up to third; soft fin like soft dorsal, but shorter; third spine 4 in head; fourth anal ray 3 1/4. Caudal deeply emarginate, to tips of median rays 2 1/8 in head. Pectoral pointed, supero-median rays longest, reaches 2/3 to anal, 1 2/5 in head. Ventral inserted behind pectoral base, fin 3/4 to anal origin; spine 2 2/5 in head, fin 1 2/5.

Dull olivaceous-brown, little paler below. Broad olive band connects eyes, edge narrowly buff. Another anterior from front eye edge, also with narrow buff bordering lines. Narrow olive line also forward from eye to front angle of preorbital. On interorbital edge along squamous area of cranium with dusky-brown, forming loup above eye posteriorly. Fins all uniform dull brown. Iris pale brown. Length 350 mm.?

One in the Bishop Museum from Shortland Island.

East Indies, Melanesia, Micronesia, Polynesia.

THERAPONIDAE

Genus THERAPON Cuvier

Subgenus THERAPON Cuvier

Lower opercular spine enlarged, extends back beyond opercular lobe. Longitudinal dusky bands. Spinous dorsal with large dark blotch and vertical fins with dark markings.

Autisthes De Vis and *Eutherapon* Fowler fall as synonyms.

Therapon theraps Cuvier.

Therapon theraps Cuvier: Hist. nat. Poiss., vol. 3, p. 97, pl. 53, 1829 (type loc., Java; Mahé).—Cuvier: Regne animal, 2nd ed., vol. 2, p. 148, 1829 (nomen nudum).—Günther: Cat. fishes Brit. Mus., vol. 1, p. 274, 1859 (False Bay).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 26, 1874 (Yap).—Weber: Nova Guinea, vol. 9, pt. 4, p. 582, 1913 (Mimika River mouth, southwest New Guinea).

Therapon cinereus Schmeltz: Mus. Godeffroy, Cat. 4, p. 13, 1869 (Samoa).

Scales 8 above lateral line. Four horizontal blackish-brown bands.

Red Sea, Zanzibar, East Indies, China, North Australia, Queensland, Melanesia, Micronesia, Polynesia.

Therapon puta Cuvier.

Therapon puta Cuvier: Hist. nat. Poiss., vol. 3, p. 98, 1829 (type loc., Mahé; Pondicherry).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 118, 1913 (Majalibit Bay, Waigiu).

Therapon trivittatus Schmeltz: Mus. Godeffroy, Cat. 4, p. 13, 1869 (South Sea).—De Vis: Linn. Soc. New South Wales, Proc., vol. 8, p. 457, 1883 (New Britain).

Scales smaller in this and next species, 13 or 15 above lateral line. Dark longitudinal bands straight.

Red Sea, Zanzibar, India, East Indies, Melanesia.

Therapon jarbua (Forskål).

Sciaena jarbua Forskål: Descriptiones animalium, pp. 12, 50, 1775 (type loc., Djedda; Suez).

Holocentrus jarbua Jouan: Soc. Cherbourg, Mem., vol. 9, p. 116, 1863 (New Caledonia).

Therapon jarbua Peters: Akad. Wiss. Berlin, Monatsb., p. 831, 1876 (1877) (New Britain).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1379, 1906 (Upolu; Savaii).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 611, 1908 (Suva, Fiji).—Weber: Nova Guinea, vol. 5, pt. 2, p. 249, 1908 (Merauke River mouth, southern New Guinea).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 289, 1911 (Suva, Fiji; Vavau and Tongatabu, Tonga Islands).—Weber: Nova Guinea, vol. 9, pt. 4, p. 582, 1913 (Mbai River at Sělså, northern New Guinea).

Therapon (Datnia) jarbua Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).

Terapon jarbua Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 45, 1906 (Shortland Island, Solomons).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 266, 1905 (1906) (Vaisigano River mouth, Samoa).

Therapon ? gerager Thiollière: Fauna Woodlark, p. 147, 1857 (type loc., Woodlark Island).

Johnius gerager (Montrouzier) Thiollière: Fauna Woodlark, p. 147, 1857 (name in synonymy).

Therapon servus Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).—Jouan: Soc. Cherbourg, Mem., vol. 9, p. 184, 1863 (on Jouan, op. cit., vol. 8, p. 287, 1861, Kanala, New Caledonia).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 13, 1869 (South Sea).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 26, 1874 (Apia; Fiji).—Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 270, 1876 (Hall Sound, New Guinea).—Jouan: Soc. Cherbourg, Mem., p. 334, 1877-78 (New Caledonia).—Macleay: Linn. Soc. New South Wales, Proc., vol. 4, p. 62, 1879 (Solomons).—Günther: Rept. voyage "Challenger," vol. 1, p. 34, 1880 (Levuka and Kandavu, Fiji).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 361, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 260, 1883 (New Guinea).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 13, 1885 (Rubi, New Guinea).—Evermann and Seale: Copeia, no. 119, p. 71, June 16, 1923 (Apia).

Body deeper than in *T. puta*, depth 2 3/5 to 2 9/10 (compared with 3 2/3). Longitudinal dark bands bulge downward.

The National Museum has 1 from Fiji, 1 Samoa and 1 labeled "Hawaii," though likely from either Fiji or Samoa, obtained by the Wilkes Expedition. Others are 1 from Samoa through C. H. White, 2 young from New Guinea, 1 Port Moresby, 3 Apia, 6 Suva. The Bishop Museum has 4 from Shortland Island. The Agassiz Museum has 1 from Tonga and 2 from Vavau.

Therapon ? gerager is likely this species as it is described as brown with 3 distinct longitudinal bands.

Red Sea, Zanzibar, Mozambique, Cape of Good Hope, India, East Indies, China, North Australia, Queensland, Melanesia, Polynesia.

Subgenus MESOPRISTES Bleeker

Lower opercular spine less developed, not extended back beyond preopercular lobe. Spinous dorsal without black blotch. Coloration varied, spotted, with horizontal bands or uniform.

Hephactus De Vis is a synonym.

Therapon caudavittatus (Richardson).

Datnia ? caudavittata Richardson: Ichth., voyage "Erebus" and "Terror," p. 24, pl. 18, figs. 3-5, 1848 (type loc., Harvey River in fresh water, West Australia).

Therapon caudovittatus Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 260, 1883 (Gulf of Papau).—Ogilby and McCulloch: Queensland Mus., Mem., vol. 5, p. 108 July 10, 1916 (Gulf of Papua; Dutch New Guinea).

This and the next with suprascapula not exposed, hidden by scales. Dorsal spines 13. Upper part and sides with round grayish spots; dorsal similarly spotted, also caudal basally, each lobe with large black oblique blotch. (Ogilby and McCulloch)

Therapon unicolor Günther.

Therapon unicolor Günther: Cat. fishes Brit. Mus., vol. 1, p. 277, 1859 (type loc., head of Mosquito Creek near Darling Downs and Gwydir River, New South Wales).

Differs from *T. caudavittatus* in usually with 12 dorsal spines. Nearly uniform or with small dark spots.

The record for *Therapon unicolor* by Kner (Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, p. 300, pl. 2, fig. 4, 1868, Kandavu, Fiji) is not this species at all but is surely *Kuhlia rupestris*.

Fresh waters of tropical and subtropical Australia.

Therapon kneri Bleeker.

Therapon kneri Bleeker: Atlas ichth. Ind. Neerl., vol. 7, p. 115, 1873-76 (on Kner).

Therapon argenteus (non Cuvier) Kner: Akad. Wiss. Wien, Sitz., vol. 58, p. 299, pl. 1, fig. 1, 1868 (type loc., Kandavu, Fiji).

Therapon maculatus Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 288, pl. 4, fig. 2, 1911 (type loc., Suva, Fiji).

Mesopristes plumbeus (part) Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 36, 1918.

Differs from *Therapon unicolor* in the longer anal spines, second more than half the head, deeper body, maxilliary short and not reaching eye and larger dark spots.

In the National Museum the type of *Therapon maculatus*, besides 5 paratypes, from Fiji. Two in the Agassiz Museum from Suva.

Therapon interruptus Macleay.

Therapon interruptus Macleay: Linn. Soc. New

South Wales, Proc., vol. 8, p. 258, 1883 (type loc., fresh water of Normanby Island, New Guinea).

Therapon (Datnia) interruptus Ogilby and McCulloch: Queensland Mus., Mem., vol. 5, p. 114, pl. 10, fig. 2, July 10, 1916 (types).

Nostrils close together. Maxillary entirely covered by lip. Silvery, with 3 longitudinal dark bands each side below lateral line, which more or less broken into elongate blotches; back with 5 broad dark crossbands obliquely downward and backward; fins uniform. (Ogilby and McCulloch)

Therapon argenteus (Cuvier).

Datnia argentea Cuvier: Hist. nat. Poiss., vol. 3, p. 104, pl. 54, 1829 (type loc., Java).

Therapon argentea Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 236, 1882 (New Guinea).—Weber: Nova Guinea, vol. 9, pt. 4, p. 582, 1913 (Sermowai River, northern New Guinea).

Therapon (Datnia) argenteus Ogilby and McCulloch: Queensland Mus., Mem., vol. 5, p. 115, July 10, 1916 (Port Moresby, New Guinea; Normanby Island, D'Entrecasteau Group, in fresh water; Santo and Eromanga, New Hebrides).

Therapon nasutus Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 258, 1883 (type loc., fresh waters of Normanby Island, New Guinea).

Therapon chalybaeus Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 259, 1883 (type loc., fresh water of Normanby Island).

Nostrils well separated. Maxillary angle not covered by lip. Uniform dusky-silvery; front and hind anal rays white; young with 3 narrow longitudinal dark bars on sides. (Ogilby and McCulloch)

Therapon fuliginosus Macleay.

Therapon fuliginosus Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 201, 1884 (type loc., Upper Burdekin, Queensland).

Therapon römeri Weber: Leyden Mus., Notes, vol. 32, pt. 4, p. 233, 1910 (type loc., Lorentz River, New Guinea).—Weber: Nova Guinea, vol. 9, pt. 4, p. 584, fig. 35, 1913 (Lorentz River at Van Weelskamp, Sabang and Regeninsel).

Scales 46 to 50 along below lateral line, 51 to 58 along above. Uniform purplish-brown, paired fins with grayish. Length 327 mm. (Ogilby and McCulloch)

Therapon römeri is described with scales 62 to 65 in the lateral line and a shorter maxillary. It is likely not distinct from *T. fuliginosus*.

Therapon trimaculatus Macleay.

Therapon trimaculatus Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 259, 1883 (type loc., fresh water of Goldie River, New Guinea).—Ogilby and McCulloch: Queensland Mus., Mem., vol. 5, p. 120, pl. 13, fig. 1, July 10, 1916 (types; York Peninsula, Queensland ?).

Therapon habbemai Weber: Leyden Mus., Notes, vol. 34, pt. 4, p. 234, 1910 (type loc., Lorentz River, New Guinea).—Weber: Nova Guinea, vol. 9, pt. 4, p. 583, figs. 33-34, 1913 (Alkmaar, Lorentz River, Bivak Island).—Regan: Zool. Soc. London, Trans., vol. 20, pt. 6, p. 276, 1914 (Mimika River, New Guinea).

Body with 6 to 8 dark longitudinal bands, of which 3 above lateral line. Reaches 200 mm. (Ogilby and McCulloch)

Therapon habbemai is said to have 54 to 56 scales in the lateral line (compared with 46 to 50 along below and 47 to 54 along above). Likely not distinct.

Pelates oxyrhynchus (Schlegel).

Therapon oxyrhynchus Schlegel: Fauna Japonica, Poiss., pt. 1, p. 16, pl. 6, fig. 3, 1842 (type loc., bays of southern Japan).—Günther; Rept. voyage "Challenger," vol. 1, p. 34, 1880 (Ovalau, Fiji).

Four deep brown longitudinal bands, broad as pupil; spinous dorsal with basal and terminal dark bands, latter extending on soft dorsal; body bands not extending on caudal, which irregularly mottled. Length 195 mm. (Jordan and Thompson)

India, China, Japan.

Pelates sexlineatus (Quoy and Gaimard).

Pristipoma sexlineatum Quoy and Gaimard: Voyage "Uranie," Zool., p. 320, Dec. 18, 1824 (type loc., Sydney, Port Jackson).

Pelates sexlineatus Cuvier: Hist. nat. Poiss., vol. 3, p. 110, 1829 (Sandwich Islands).

Therapon cuvieri Schmeltz: Mus. Godeffroy, Cat. 4, p. 13, 1869 (Kandavu, Fiji).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 237, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 260, 1883 (New Guinea).

Differs from *P. oxyrhynchus* in 5 deep brown longitudinal bands, broad as pupil; fins uniform.

Australia, Melanesia, Micronesia.

Helotes lorentzi Weber.

Helotes lorentzi Weber: Leyden Mus., Notes, vol. 32, p. 236, 1910 (type loc., Lorentz River, New Guinea).—Weber: Nova Guinea, vol. 9, pt. 4, p. 586, fig. 36, 1913 (Lorentz River at Regen Island).

Head 3 1/3; depth 2 1/4; D. XIII or XIV, 11 to 13; A. III, 8 or 9; scales 52 to 54 in lateral line, 8 above, 13 or 14 below. Dusky with silvery sheen, each scale with dark border. Vertical fins blackish with clear borders. Paired fins light. Length 200 mm. (Weber)

Datnioides quadrifasciatus (Sewastianoff).

Chaetodon quadrifasciatus Sewastianoff: Acad. St. Petersburg, Mem., vol. 1, p. 448, pl. 18, 1809.

Datnoides quadrifasciatus Weber: Nova Guinea, vol. 9, pt. 4, p. 570, 1913 (Bivak Island, Lorentz River, Rivierkamp and Alkmaar).

Head 2 1/2; depth 2 1/4; D. XII, 13 or 14; A. III, 8 or 9; scales 72 along above lateral line, 60 along below, 12 above, 25 below; eye 5 in head from snout tip. Brownish, glossed with copper and 6 or 7 narrow brown vertical bands, similar ones radiating from orbit. Length 305 mm. (Day)

Rivers and tidal estuaries of India, Siam, and the East Indies.

LETHRINIDAE

Genus LETHRINUS Cuvier

Subgenus LETHRINUS Cuvier

Lateral teeth of jaws obtuse and molar.

Lethrinus mahsena (Forskål).

Sciaena mahsena Forskål: Descriptiones animalium, pp. 12, 52, 1775 (type loc., Arabia).

Lethrinus mahsena Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Kandavu).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 65, pl. 48, 1874 (Pelew Islands; Fiji; Hervey Islands; Paumotus).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 47, 1906 (Mangareva).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 270, 1905 (1906) (Apia).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 14, 1925 (Wake Island).

Lethrinus erythropterus Valenciennes: Hist. nat. Poiss., vol. 6, p. 234, 1830 (type loc., Ulea).

?Lethrinus erythrophthalmus Kittlitz: Denkw. Reis. Mikronesien, vol. 2, p. 87, 1858 (Senjawins Island in N. Lat. 6° 43', W. Long. 20 1/2°).

Head 2 4/5 to 2 7/8; depth 2 2/5 to 3 1/4; D. X, 8, 1 or 9, 1; A. III, 7, 1 or 8, 1; tubular scales in lateral line 44 to 47 to caudal base and 1 to 3 more on latter;

5 or 6 scales above lateral line to spinous dorsal origin, 15 below, 8 or 9 predorsal; snout 1 2/3 to 2 in head from snout tip; eye 3 1/5 to 4 4/5; maxillary 2 1/2 to 2 3/4; interorbital 3 1/2 to 4 3/5.

Body elongately ovate, deep, compressed, back elevated, deepest at third dorsal spine. Caudal peduncle strongly compressed, least depth 1 1/3 to 2 3/5 in its length or 2 3/4 to 3 4/5 in total head length. Head width 2 1/10 to 2 1/2 in its length. Snout conic, upper profile little concave, width 1 3/5 to 2 1/5 in its length. Eye elevated, center at last third in head, large, 1 4/5 to 2 4/5 in snout, equals postocular part of head, 1 1/8 to little greater than interorbital. Mouth moderate, but little inclined from horizontal. Maxillary reaches opposite posterior nostril; expansion 2 1/5 in eye. Lips fleshy, rather thick, finely papillose. Teeth above with outer row of conic ones and posterior 3 enlarged molars, inner upper band of fine villiform teeth; mandibular teeth similar, only with last 5 as molars; outer anterior teeth in each jaw as 4 canines. Front nostril at last third or fifth in snout; hind nostril large, higher, closer to eye than to anterior. Interorbital broadly and slightly convex. Preopercle edge entire. Gill rakers 5 + 5, low, obtuse, 1 3/4 in gill filaments, which 2 to 3 1/5 in eye. Scales with 13 to 17 basal radiating striae; apical denticles 103 to 188, transverse basal elements in 4 to 21 series; circuli fine. Third dorsal spine 2 2/3 to 3 4/5 in head; fifth dorsal ray 2 to 2 7/8; third anal spine 2 1/2 to 4 1/5; third anal ray 1 7/8 to 2 1/2; caudal 1 1/4 to 1 3/5, emarginate to deeply lunate; pectoral 1 to 1 4/5, reaches base of third anal spine; ventral 1 1/3 to 1 7/8.

Above dull broccoli-brown, below ecru-drab or paler. Head with gray-brown tints to deep drab-gray. Iris and maxillary yellow. Inside mouth orange-red. Vertical fins all with more or less deeper brownish medianly, ventral and anal with whitish. Paired fins pale uniform brownish, axil of pectoral orange tint.

Two in the Bishop Museum from Mangareva, 176 to 178 mm. One from Wake Island obtained by the Tanager Expedition, 462 mm. In the Agassiz Museum 1 from Ponapé, Caroline Islands, obtained by Rev. L. H. Gulick in 1860. Length 167 mm. In the National Museum 2 from Apia, one of which obtained by W. H. Jones, May 15, 1883.

Lethrinus erythropterus may be the same species. It is suggestive somewhat of Günther's figure. Valenciennes says:

Chiefly all brown; lips pale red; lower preopercle limb reddish; all fins light red, more bright than lips; caudal bordered brown above and below; some brown spots on spinous dorsal membrane. Length 153 mm.

Red Sea, Seychelles, Philippines, Micronesia, Polynesia.

Lethrinus reticulatus Valenciennes.

Lethrinus reticulatus Valenciennes: Hist. nat. Poiss., vol. 6, p. 221, 1830 (type loc., New Guinea).—Bleeker: Atlas ichth., vol. 8, p. 116, pl. (52) 330, fig. 1, 1876-77 (New Guinea).

Lethrinus moensii Bleeker: Nat. Tijds. Ned. Ind. vol. 9, p. 435, 1855 (type loc., Obi Major, Batjan).—Günther: Cat. fishes Brit. Mus., vol. 1, p. 455, 1859 (Louisiades).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 64, pl. 46, fig. A, 1874 (Paumotus, Society Islands, Friendly Islands, Samoa, Hervey Islands, Kingsmills, Pelew Islands).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 12, 1877 (Pelew Islands).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 290, 1911 (Suva, Fiji).—Fowler: B. P. Bishop Mus., Bull. 22, p. 10, 1925 (Guam).

Lethrinus moensi Günther: Rept. voyage "Challenger," vol. 1, p. 34, 1880 (Kandavu, Fiji).

Lutianus bonhamensis (non Günther) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 79, 1900 (1901) (Guam).

Head 3; depth 3; D. X, 9, 1; A. III, 8, 1; scales 47 in lateral line to caudal base and 1 more on latter (6 more non-tubular); 6 scales above lateral line to spinous dorsal origin, 15 below; 9 predorsal scales; snout 2 in head measured from upper jaw tip; eye 3 1/3; maxillary 2 2/5; interorbital 3 2/3. Least depth of caudal peduncle 3 in head. Head width 2 in its length; depth over hind eye edge 1 1/6 its length. Fourth dorsal spine 2 3/4 in head; fifth dorsal ray 2 3/5; third anal spine 3 1/3; second anal ray 3; caudal 1 1/3; pectoral 1 1/6; ventral 1 3/5. Length 197 to 269 mm.

Two from Guam in 1900 and 3 in 1923, in the Bishop Museum. In the National Museum 5 from Moen and 1 from Suva.

Variously 7 transverse dusky streaks on back, as reticulations in young. Apparently *Lethrinus reticulatus* is the young and *Lethrinus moensi* the adult.

Jouan describes under *Sparus* No. 16 (Soc. Cherbourg, Mem., vol. 9, p. 114, 1863) a specimen 110 mm. long from Baie du Sud, New Caledonia: D. XI, 9; A. III, 8. Body nearly oval. Head large, pointed, 3 without caudal. Snout pointed, front long. Eye very large, high, greater than interorbital. Jaws equal, both with 2 large canines, small irregular teeth lateral, 2 round molars. Caudal forked. Gray and greenish, with oblique brown lines. Yellow and red at pectoral and anal.

Previously he also described *Sparus* No. 37 (op. cit., vol. 8, p. 261, 1861) from the same locality, which also may be *Lethrinus reticulatus*. It differs in ten dorsal spines. Clouded dark vertical bands present. Fins red. Lips and inside mouth red.

Seychelles, East Indies, Melanesia, Micronesia, Polynesia.

Lethrinus variegatus Valenciennes.

Lethrinus variegatus (Ehrenberg) Valenciennes: Hist. nat. Poiss., vol. 6, p. 213, 1830 (type loc., Massuah; Suez).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 247, 1882 (New Guinea).

Depth 3 1/2 to 3 4/5; maxillary 3 in head; 5 scales above lateral line; young with brown median lateral band from eye to caudal giving place to dark transverse bands which disappear with age. Length 340 mm (Bleeker)

Red Sea, Zanzibar, Mozambique, East Indies.

Lethrinus mahsenoides Valenciennes.

Lethrinus mahsenoides (Ehrenberg) Valenciennes: Hist. nat. Poiss., vol. 6, p. 212, 1830 (type loc., seas of India).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Viti Levu).—Ramsay and Ogilby: Linn. Soc. New South Wales, Proc., vol. 2, pt. 1, p. 8, 1886 (Strickland River, New Guinea).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 290, 1911 (Vavau, Tonga).

Depth 2 4/5; eye 3 to 3 1/2 in head; maxillary 2 4/5;

5 scales above lateral line; body olivaceous, paler below; vertical fins spotted with dusky. (Klunzinger)

The National Museum has 3 from Fiji, obtained by the Wilkes Expedition. Also an adult from Vavau through the *Albatross*. The Agassiz Museum has 1 from Vavau.

Red Sea, Mozambique, East Indies, Melanesia, Polynesia.

Lethrinus ornatus Valenciennes.

Lethrinus ornatus Valenciennes: Hist. nat. Poiss., vol. 6, p. 231, 1830 (type loc., Java).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).—Bleeker: Atlas ichth., vol. 8, p. 118, pl. (72) 350, fig. 4, 1876-77 (New Guinea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 247, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 264, 1883 (New Guinea).

?Lethrinus aurolineatus Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 247, 1883 (type loc., New Guinea).

Depth 2 1/2 to 2 2/3; eye 3 to 3 1/2 in head; maxillary 2 2/3 to 3; 6 rows of scales above lateral line; body with 6 or 7 yellow longitudinal bands; vertical fins rosy, paired fins yellow. Length 302 mm. (Bleeker)

The imperfect account of *Lethrinus aurolineatus* seems suggestive of this species. It was based on a specimen 456 mm. long with scales 45 (compared with 48). The color is given as "pale yellowish olive, with about eleven golden longitudinal streaks on each side of the body; the fins seem to have a uniform yellow."

East Indian region.

Lethrinus carinatus Weber.

Lethrinus carinatus Weber: Siboga Exped., vol. 65, p. 289, pl. 2, fig. 1, text fig. 68, 1913 (type loc., Seget, Galewo Straits, New Guinea; Tual, Niedrig Kei).

Depth 2 2/5; eye 4 1/2 in head, maxillary 3; 6 rows of scales above lateral line, which has 48. Head dark red-brown, sometimes with 4 dark bands on cheek. Scales with dark hind edges and clear, pearly or yellowish centers, sometimes as 4 to 6 longitudinal dark brown bands between pectoral and lateral line and another along base of dorsal. Soft dorsal with dark, oblique, longitudinal bands. Anal dark violet. Caudal with dark crossbands. Pectoral yellow. Ventral dark violet on hind half. Length 490 mm. (Weber)

East Indies.

Lethrinus ramak (Forskål).

Sciaena ramak Forskål: Descriptiones animalium, p. 52, 1775 (type loc., Arabia).

Lethrinus ramak Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 64, pl. 46, fig. B, 1874 (Samoa, Pelew Islands, Kingsmills).—Günther: Rept. voyage "Challenger," vol. 1, p. 34, 1880 (Levuka, Fiji).—Waite: Australian Mus., Mem., no. 3, p. 185, 1897 (Funafuti, Ellice Islands).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1385, 1906 (Samoa).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 269, 1905 (1906) (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 289, 1911 (Taritari, Gilberts).

Lethrinus flavescens Valenciennes: Hist. nat. Poiss., vol. 6, p. 222, 1830 (type loc., Tongatabu).

? Lethrinus azureus Valenciennes: Hist. nat. Poiss., vol. 6, p. 223, 1830 (type loc., Cartaret Harbor, New Ireland).

Head 2 3/4; depth 2 3/4; D. X, 9, 1; A. III, 8, 1; scales 47 in lateral line to caudal base and 1 more on latter; 7 scales above lateral line, 15 below; 8 predorsal scales; snout 2 in head; eye 4; maxillary 2 3/4; interorbital 4.

Least depth of caudal peduncle 3 in its length. Head width 2 1/5 in its length, depth over hind eye edge 1 1/4. Snout width 1 3/5 in its length. Maxillary reaches opposite front nostril. Lips rather wide, upper 1 7/8 in eye. Posterior teeth enlarged, low, conic. Gill rakers 5 + 5, tubercles, 1/3 of gill filaments, which 2 1/6 in eye. Scales with 14 to 16 basal radiating striae; apical denticles 85 to 90, basal elements in 9 series. Fourth dorsal spine 2 7/8 in head; sixth ray 1 1/3; third anal spine 3; second ray 2 3/4; caudal 1 1/3; pectoral 1 1/4; ventral 1 3/5. Uniform brownish. Yellowish band from about level with eye back toward middle of caudal base.

In the Bishop Museum 2 from Faté, 100 and 155 mm. long. The National Museum has a specimen 410 mm. long, without locality though likely from Fiji?, obtained by the Wilkes Expedition. Other specimens 2 from Apia and 2 from Taritari.

Possibly the imperfectly noticed *Lethrinus azureus* may be this species. It is said to be near *Lethrinus flavescens*. Azure or sky blue, without any spot. Inside mouth red. Fins bordered red. Length 305 mm. Reaches 610 mm.

Lethrinus harak (Forskål).

Sciaena harak Forskål: Descriptiones animalium, pp. 12, 52, 1775 (type loc., Arabia).

Lethrinus harak Bleeker: Akad. Wiss. Amsterdam, Verslagen, ser. 2, vol. 2, p. 299, 1868 (Waigiu).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Viti Levu).—Peters: Akad. Wiss. Berlin, Monatsb., p. 834, 1876 (1877) (New Hanover).—Bleeker: Atlas ichth., vol. 8, p. 119, pl. (49) 327, fig. 3, 1876-77 (Waigiu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 246, 1882 (New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 47, 1906 (Faté; Shortland Island).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1385, 1906 (Savaii).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 270, 1905 (1906) (Apia).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 611, 1908 (Suva, Fiji).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 289, 1911 (Suva; Kusaie, Carolines; Vavau, Tonga Islands).—Pellegrin: Mus. Paris, Bull. 18, p. 206, 1912 (Port Sandwich, New Hebrides).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 12, 33, 1925 (Guam, Samoa).

Lethrinus bonhamensis Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 65, pl. 47, 1874 (type loc., Bonham Islands).

Lethrinus papuensis Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 276, pl. 8, fig. 1, 1876 (type loc., Hall Sound, New Guinea).

Lethrinus leutjanus (non Lacépède) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 47, 1906 (Faté).

Head 2 7/8; depth 2 4/5; D. X, 9, 1; A. III, 8, 1; scales 43 in lateral line to caudal base and 3 more on latter (4 more non-tubercular); 6 scales above lateral line, 15 below; 10 predorsal scales; snout 2 in head; eye 3 4/5; maxillary 2 1/3; interorbital 3 1/3. Least depth of caudal peduncle 3 in head. Head width 2 1/6 in its length. Fourth dorsal spine 2 3/5; fourth dorsal ray 2 1/3; third anal spine 3 1/4; second anal ray 3; caudal 1 1/8?; pectoral 1 1/8; ventral 1 3/5?.

Jouan apparently describes this as *Lethrinus* or *Sargus* No. 42, from Port de France, New Cale-

donia (Soc. Cherbourg, Mem., vol. 8, p. 266, 1861): Only 6 anal rays. Gray with blackish and deep green like mosaic on flanks. Vertical and oblique deep green streaks on cheeks. Ventrals seagreen, other fins yellow. Length 500 mm.

In the Bishop Museum 1 from Shortland and 2 from Faté, latter 311 mm. One from Guam in 1923. The National Museum has 2 from New Guinea, 1 Kusaie, 1 Suva, 1 Vavau, 4 Apia. The Agassiz Museum has 1 from Apia, 1 Suva and 1 Kusaie.

Well marked with the large dark blotch at the middle of the side of the body. *Lethrinus papuensis* is a synonym of the present species.

Red Sea, Zanzibar, Andamans, East Indies, Queensland, Melanesia, Micronesia, Polynesia.

Lethrinus leutjanus (Lacépède).

Bodianus leutjan Lacépède: Hist. nat. Poiss., vol. 4, pp. 281, 293, 1802 (no type loc.; Collection zoologique cédee par la Hollande à la France).

Lethrinus leutjanus Valenciennes: Hist. nat. Poiss., vol. 6, p. 231, 1830 (origine non marquée, mais probalement de Java).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 247, 1882 (New Guinea).—Pellegrin: Mus. Paris, Bull. 4, p. 229, 1898 (Agrigan, Mariannes).

Lethrinus lutjanus Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869, (South Sea).

Lethrinus lentjanus Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 264, 1883 (New Guinea).

Head 2 7/8; depth 3 1/6; D. X, 9, 1; A. III, 8, 1; tubular scales 47 in lateral line to caudal base and 1 more on latter; 6 scales above lateral line to spinous dorsal origin, 4 to soft dorsal origin, 15 below; 8 predorsal scales; snout 1 2/3 in head; eye 5; maxillary 2 4/5; interorbital 3 4/5.

Body elongately ellipsoid, well compressed. Least depth of caudal peduncle half its length, 3 1/4 in head. Head width 2 1/5 in its length, sides compressed and flattened. Snout with greatly inclined profile. Eye high, front edge behind center in head length; diameter 3 in snout, 1 1/4 in interorbital. Maxillary not extending to front nostril, about 2/3 to eye. Lips broad, fleshy. Jaws even. Teeth uniserial; 4 front canines above, 3 below. Front nostril 2/3 of eye diameter before front eye edge; hind nostril higher, similar, nearer eye. Interorbital slightly concave. Preopercle with hind edge greatly inclined. Gill rakers as III+VI, low broad tubercles. Scales in even longitudinal series; 6 rows on opercle; suprascapula scale large; tubes in lateral line simple, concurrent with dorsal profile of back. Third dorsal spine higher, 2 1/2 in head; second dorsal ray 3 1/3; third anal spine longest, 4; first anal ray 3 1/6; caudal 1 2/5, emarginate behind; pectoral 1 2/3; ventral 1 3/4, spine 5/7 of fin, fin reaches slightly beyond pectoral tips, not quite to vent. Uniform brown.

In the Agassiz Museum one labeled from the Hawaiian islands obtained by Andrew Garrett, 412 mm. This species has not before been reported from the Hawaiian sub-region.

East Indies, Micronesia, Hawaii.

Lethrinus cocosensis Bleeker.

Lethrinus cocosensis Bleeker: Nat. Tijds. Ned. Ind., vol. 7, p. 40, 1854 (type loc., Nova Selma [Cocos Island, Indian Ocean]).—Bleeker: Atlas ichth., vol. 8, p. 121, pl. (18) 296, fig. 1, 1876-77 (New Guinea?).

? Lethrinus sordidus Valenciennes: Hist. nat. Poiss., vol. 6, p. 222, 1830 (type loc., New Guinea).

Depth 2 4/5 to 3; eye 3 to 3 1/2 in head, maxillary 3; 6 scales above lateral line; olive above, whitish below; 5 dark transverse bands on back and 4 or 5 longitudinal yellowish bands. Length 162 mm. (Bleeker)

The account of *Lethrinus sordidus* may also be intended for the present species. It is based on an example but 89 mm. long, with 8 blackish transverse bands crossing 18 to 20 longitudinal blackish streaks. Possibly both are only younger stages of *Lethrinus leutjanus*.

Lethrinus nebulosus (Forskål).

Sciaena nebulosa Forskål: Descriptiones animalium, pp. 12, 52, 1775 (type loc., Arabia).

Lethrinus nebulosus Günther: Rept. voyage "Challenger," vol. 1, p. 34, 1880 (Levuka, Fiji).

? Lethrinus alboguttatus Valenciennes: Hist. nat. Poiss., vol. 6, p. 235, 1830 (type loc., Bonin Islands).

Depth 2 3/5; eye 4 to 4 1/2 in head; maxillary 2 2/3; 5 scales above lateral line; blue, black-edged band from eye to hind nostril, second to mouth angle and another blue line below eye; inside mouth orange; opercle membrane red or yellow; body olivaceous, lighter below; scales orange medially, every other row dotted blue basally; sometimes faint vertical bands present and dark blotch between lateral line and pectoral; vertical fins slaty, dorsal edged reddish and with 2 rows of blue spots; faint lines along soft anal and caudal with narrow transverse blue bars; upper pectoral rays blue in basal half. Length 408 mm. (Day)

Lethrinus alboguttatus may be this species, though it is so briefly noticed as to preclude positive identification. The few color items follow: Body brown, each scale with white point. Head reddish-brown. Before eye 3 green streaks. Fins brown. Caudal bordered above and below reddish and spotted violet. Length 204 mm.

Lethrinus laticaudis Alleyne and Macleay: (Linn. Soc. New South Wales, Proc., vol. 1, p. 276, pl. 8, fig. 2, 1875-76, type loc., Percy Islands, Queensland) is a synonym.

Red Sea, India, Queensland, Micronesia, Polynesia.

Subgenus LETHRINICHTHYS Jordan and Thompson

Lateral teeth of jaws conic, not molar.

Lethrinus opercularis Valenciennes.

Lethrinus opercularis Valenciennes: Hist. nat. Poiss., vol. 6, p. 214, 1830 (type loc., Trinquemale, Ceylon).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 123, 1913 (Saonek, Waigiu).

According to Day differs from *Lethrinus nebulosus* in eye 1 3/4 in snout (compared with 2 to 2 1/2) and second anal spine nearly long as third. Reaches 381 mm.

India, East Indies.

Lethrinus nematacanthus Bleeker.

Lethrinus nematacanthus Bleeker: Nat. Tijds. Ned. Ind., vol. 6, p. 403, 1854 (type loc., Nagasaki).—Günther: Cat. fishes Brit. Mus., vol. 1, p. 456, 1859 (Louisiades).

Differs from the following in the second dorsal spine filamentous and but little less than head; 6 rows of scales above lateral line and more slender body.

Possibly *Lethrinus xanthopterus* Valenciennes

(Hist. nat. Poiss., vol. 6, p. 235, 1830, type loc., Ulea) may be the same. It is only briefly noticed with a few color items: Back orange-red. Face brown, vermiculate with orange streaks. On belly some irregular yellow streaks. Spinous dorsal rose, soft dorsal, anal and pectoral yellow. Caudal rose, bordered with yellow median crescent. Less than 200 mm.

Jouan describes as *Lethrinus* or *Sargus* No. 41 from Baie du Sud, New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 265, 1861) a specimen 300 mm. long evidently this species: Gray with greenish and golden reflections. Many longitudinal blackish lines. Soft rays of fins golden-yellow, membranes reddish. Pectoral yellow, ventral violet. Inside mouth, lips and dorsal edge red. Red spot at origin of pectoral and ventral.

Lethrinus haematopterus Schlegel.

Lethrynus haematopterus Schlegel: Fauna Japonica, Poiss., pts. 5-6, p. 74, pl. 38, 1844 (type loc., southwest coast of Japan).

Lethrinus haematopterus Günther: Rept. voyage "Challenger," vol. 1, p. 34, 1880 (Kandavu, Fiji).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 264, 1883 (Engineer Group, New Guinea).

Lethrinus richardsonii Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 291, 1911 (Truk Group, Carolines; Vavau, Tonga).

Head 2 2/3; depth 2 2/3; D. X, 9, 1; A. III, 8 1; tubular scales 45 in lateral line to caudal base and 2 more on latter; 6 scales above lateral line to spinous dorsal origin, 14 below; 8 predorsal scales; snout 1 3/4 in head; eye 5 1/5; maxillary 1 7/8; interorbital 3 3/4.

Body deep, oblong, well compressed. Head deep, upper profile well inclined. Snout profile concave in front, width 1 7/8 its length. Eye high, front edge behind middle in head length; diameter 3 in snout, 3 3/5 in interorbital. Maxillary reaches eye. Lips thick, fleshy. Teeth uniserial large canines, several forward but slightly larger; inside each jaw anteriorly band of fine teeth. Front nostril 2/3 eye diameter before eye; hind one higher and nearer eye. Interorbital evenly convex. Hind preopercle edge vertical. Gill rakers IV+VI, low, broad tubercles. Scales in even longitudinal rows; small ones on caudal base; 6 rows across cheek to opercle; tubes in lateral line simple, concurrent with dorsal profile of back. Fourth dorsal spine 3 1/2 in head; third dorsal ray 2 1/4; third anal spine longest, 3 4/5; third anal ray 2; least depth of caudal peduncle 2 7/8, or 1 1/3 its own length; caudal truncate, double-convex expanded, 1 4/5 in head; pectoral reaches anal, 1 1/4 in head; ventral reaches vent, 1 3/5, spine 2 in fin.

Largely brown. Jaws pale, especially lower. Each scale with pale straw-colored spot, well defined. Fins pale or yellowish-dusky or brownish basally, with fine mottlings, outer portions broadly pale. Length 521 mm.

One in the Agassiz Museum from Ebon Island, Marshalls, from Rev. B. G. Snow in 1877. One in the National Museum from New Guinea, 330 mm. long. Also 6 from Truk and 1 from Vavau.

Lethrinus erythracanthus Valenciennes (Hist. nat. Poiss., vol. 6, p. 234, 1830, type loc., Luganor) is another doubtful species, known only from a few color notes. Possibly it may be the present species. Back violet, sprinkled with blue spots. Belly pale violet. Head red brown, marbled with bistre. Lips reddish. Fins with violet membranes, rays red. Length 204 mm.

East Indies, China, Japan, Queensland, Melanesia, Micronesia, Polynesia.

Lethrinus kallopterus Bleeker.

Lethrinus kallopterus Bleeker: Soc. Sci. Ind. Neerl., Act. (Manado), vol. 1, p. 47, 1856 (type loc., Manado, Celebes).—Bleeker: op. cit., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).—Bleeker: Atlas ichth., vol. 8, p. 113, pl. (73) 351, fig. 3, 1876-77 (New Guinea).

Both this and the next differ from the preceding in the soft anal deeper than long. All agree in having 5 rows of scales above lateral line. Depth 2 2/5 to 2 3/4; maxillary 2 in head; caudal lobes obtuse; vertical fins streaked or spotted with orange. Length 375 mm. (Bleeker).

East Indian region.

Lethrinus hypselopterus Bleeker.

Lethrinus hypselopterus Bleeker: Nederlandsch Tijds. Dierk., vol. 4, p. 326, 1873 (type loc., Benculen, Sumatra; Singapore; Batavia, Java; Obi-major; Lawajong, Solor; Waigiu).—Bleeker: Atlas ichth., vol. 8, p. 114, pl. (52) 330, fig. 3, 1876-77 (Waigiu).

Depth 2 1/3 to 2 1/2; maxillary 3 in head; caudal lobes pointed; largely uniform olivaceous above, paler below; pectoral with 2 reddish transverse basal bands Length 260 mm. (Bleeker)

East Indian region.

Lethrinus amboinensis Bleeker.

Lethrinus amboinensis Bleeker: Nat. Tijds. Ned. Ind., vol. 6, p. 490, 1854 (type loc., Amboina).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 63, 1874 (Pelew Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 246, 1882 (New Guinea).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 270, 1905 (1906) (Apia).

Depth 3 1/2; maxillary 2 3/4 in head; 5 scales above lateral line; 10 or 11 transverse dusky bands on body; black blotch on side above pectoral; vertical fins and ventral with rows of dusky spots. Length 115 mm. (Bleeker)

One from Apia in the National Museum.

East Indies, Melanesia, Micronesia, Polynesia.

Lethrinus chrysostomus Richardson.

Lethrinus chrysostomus Richardson: Voyage "Erebus" and "Terror," Ichth., p. 118, 1844-48 (type loc., Norfolk Island).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Samoa).

Depth 3 1/4; eye 3 in snout (less than snout in young); maxillary reaches opposite hind nostril; 5 scales above lateral line; olive, each scale of back and sides with black, basal vertical streak; head, vertical fins and ventrals blackish-brown, caudal variegated lighter. Length 460 mm. (Günther)

Australia. Listed from Samoa.

Subgenus LETHRINELLA Fowler

Snout long and pointed. Lips broadly fleshy. Teeth all conic.

Lethrinus miniatus (Schneider).

Sparus miniatus (Forster) Schneider: Systema ichth., Bloch, p. 281, 1801 (type loc., Pacific Ocean).—Lichtenstein: Descriptionēs animalium, Forster, p. 289, 1844 (Namocka Island, New Caledonia).

Lethrinus miniatus Valenciennes: Hist. nat. Poiss., vol. 6, p. 235, 1830 (Pacific Ocean).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 63, 1874 (Upolu).—Bleeker: Atlas ichth., vol. 8, p. 121, pl. (31) 309, fig. 3, 1876-77 (Waigiu; New Guinea).—Steindachner: Akad Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1385, 1906 (Upolu).

Lethrinella miniata Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 270, 1905 (1906), (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 291, 1911 (Rangiroa and Fakarava, Tuamotus).

Lethrinus rostratus (Kuhl and Van Hasselt) Valenciennes: Hist. nat. Poiss., vol. 6, p. 220, 1830 (type loc., Batavia).—Peters: Akad. Wiss. Berlin, Monatsb., p. 834 1876 (1877) (New Britain).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 246, 1882 (New Guinea).—Vaillant: Soc. Philom. Paris, Bull., 7th ser., vol. 11, p. 60, 1886-87 (Marutea au Sud, Paumotu).—Weber: Zool. Forsch. Austral. (Semon), vol. 5, p. (104) 264, 1895 (coast of New Guinea).—Waite: Australian Mus., Mem., no. 3, p. 185, 1897 (Funafuti, Ellice Islands).—Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 131, 1902 (1903) (Marcus Island).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 35, p. 117, 1912 (Rikitea, Mangareva, Gambier Islands).

Lethrinus waigiensis Valenciennes: Hist. nat. Poiss., vol. 6, p. 221, 1830 (type loc., Waigiu; New Guinea).

Lethrinus moensii (non Bleeker) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 47, 1906 (Nukuhiva, Marquesas Islands).

Head 2 7/8; depth 3 1/2; D. X, 9, 1; A. III, 8, 1; scales 47 in lateral line to caudal base and 5 more on latter; 6 scales above lateral line to spinous dorsal origin, 15 below; 10 predorsal scales; snout 1 3/5 in head; eye 5 2/3; maxillary 2 2/5; interorbital 4. Least depth of caudal peduncle 3 3/4 in head. Head width 2 in its length. Third dorsal spine 3 1/2 in head; third anal spine 5 1/4; second anal ray 3 7/8; caudal 1 2/3; pectoral 1 2/3; ventral 2. Lips broad, thick, coriaceous, width of upper 1 2/5 in eye. Maxillary reaches opposite front nostril, which 2/3 an eye diameter before eye. Length 687 mm.

In the Bishop Museum 1 from Palmyra Island, obtained by C. Montague Cooke Jr. in 1917, 1 Marcus Island, 1 Nukuhiva. The National Museum contains 2 from Tahiti obtained by W. H. Jones, June 12-15, 1883, 1 "Tempe" in the Marquesas also from Jones, June 23, 1883, 1 Fakarawa and 1 Easter Island.

This species is readily distinguished by its elongate snout and conic teeth all around the jaws.

Red Sea, Zanzibar, Mozambique, India, East Indies, Melanesia, Polynesia.

Pentapus aurolineatus (Lacépède).

Sparus aureolineatus Lacépède: Hist. nat. Poiss., vol. 4, pp. 42, 132, 1802 (no type locality) (on Commerson).

Pentapus aurolineatus Günther: Cat. fishes Brit. Mus., vol. 1, p. 381, 1859 (Louisiades).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 33, pl. 25 B, 1874 (Kingsmills, Hervey Islands, Samoa, Friendly Islands, Society Islands, Paumotus, Louisiades).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 23, 1874 (Samoa, Tahiti).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 240, 1882 (New Guinea).—Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, pt. 1, p. 130, 1902 (1903) (Marcus Island).—Pellegrin: Mus. Paris, Bull. 18, p. 206, 1912 (Port Sandwich, New Hebrides).—Fowler: B. P. Bishop Mus., Bull. 22, p. 10, 1925 (Guam).—Fowler: B. P. Bishop Mus., Bull. 38, p. 15, 1927 (Christmas Island).

Gnathodentex aurolineatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 45, 1906 (Tubuai; Mangareva).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 269, 1905 (1906) (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 35, p. 117, 1912 (Mangareva).

Head 3 1/4; depth 2 3/4; D. X, 10, 1; A. III, 9, 1; scales 70 in lateral line to caudal base and 6 more on latter; 7 scales above lateral line, 17 below; 17 predorsal scales; snout 3 in head measured from upper jaw tip; eye 3 3/5; maxillary 3 1/6; interorbital 3. Least depth of caudal peduncle 2 3/5 in its total length. Head width 1 4/5 in its length. Fourth dorsal spine 2 1/4 in head; fourth dorsal ray 1 3/4; third anal spine 2 1/2; second anal ray 2 1/4; pectoral 1 1/8; ventral 1 1/4. Length 292 mm.

The Bishop Museum contains 1 from Marcus Island, 1 Nukuhiva, 1 Tubuai and 5 Mangareva. Four from Guam in 1923. The National Museum has 1 from New Guinea, 4 Apia, 10 Mangareva.

Günther gives the color as silvery greenish on the back with 4 yellowish longitudinal bands, silvery blotch on back below soft dorsal and vertical fins with red borders.

Mauritius, East Indies, Melanesia, Micronesia, Polynesia.

Pentapus vitta (Quoy and Gaimard).

Pentapodus vitta Quoy and Gaimard: Voyage "Uranie," Zool., p. 294, pl. 44, fig. 4, December 18, 1824 (type loc., China Sea).

Pentapus vitta Günther: Rept. voyage "Challenger," vol. 1, p. 39, 1880 (south of New Guinea, S. Lat. 9° 59′ E. Long. 139° 42′).

Depth 4 in total, equals head; D. X, 9; A. III, 7 or 8; scales 60 in lateral line, 6 above, 20 below; eye shorter than snout; interorbital 4 in head; preopercle scales in 6 rows, margin without distinct scales and slightly striated; fin spines feeble; caudal acutely forked; second anal spine 1/2 third; broad brownish-black band from snout through eye to upper half of caudal base. (Günther)

Australia, China Sea.

Pentapus trivittatus (Bloch).

Labrus trivittatus Bloch: Nat. ausländischen Fische, pt. 5, p. 106, 1791 (type loc., Japan).

Sparus vittatus Bloch: Nat. ausländischen Fische, pt. 5, pl. 275, 1791.

Pentapus vittatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 46, 1906 (Shortland Island, Solomons).

Head 3 1/4; depth 3; D. X, 10, 1; A. III, 7, 1; scales 42 in lateral line to caudal base and 5 more on latter; 4 scales above lateral line, 11 below; 27 predorsal scales; snout 2 5/6 in head; eye 4 1/8; maxillary 2 7/8; interorbital 2 7/8. Least depth of caudal peduncle 2 2/3 in head. Head width 2 in its length. Fourth dorsal spine 2 in head; fourth dorsal ray 2 1/3; third anal spine 3 1/8; first anal ray 2 1/2; caudal 1 1/8; pectoral 1 2/5; ventral 1 1/5. Length 234 mm.

In the Bishop Museum 4 from Shortland Island. These agree best with Bleeker's figure of *Pentapus bifasciatus* (Atlas ichth., vol. 7, pl. [16] 294, fig. 5, 1873-76), but that represents a young specimen. It does not show, however, the "pectoralibus basi vitta transversa olivacea" which Bleeker describes and which is present in all my specimens as very deep brown. Günther in quoting Valenciennes for his *Pentapus vittatus* (Cat.

fishes Brit. Mus., vol. 1, p. 382, 1859) gives D. X, 8 and scales in lateral line 32 obviously miscounts.

India, East Indies, Melanesia.

Pentapus caninus (Cuvier).

Scolopsides caninus Cuvier: Hist. nat. Poiss., vol. 5, p. 266, 1830 (type loc., Doreh, New Guinea).

Scolopsis caninus Günther: Cat. Fishes Brit. Mus., vol. 1, p. 364, 1859 (copied).

Heterognathodon caninus Günther: Mus. Godeffroy, Jour., vol. 2-3, pts. 5-6, p. 32, 1874 (Apamana, Gilberts).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 12, 1877 (Bonham Islands).

Pentapus caninus Bleeker: Atlas ichth., vol. 8, p. 103, pl. (30) 310, fig. 3, 1876-77 (Doreh, New Guinea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 240, 1882 (New Guinea).

Heterognathodon microdon Günther: Cat. fishes Brit. Mus., vol. 1, p. 366, 1859 (Louisiades).

Heterognathodon bifasciatus Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Pelew Islands).

Preopercle edge weakly denticulate and limb entirely scaled; 7 rows of scales on cheek; canines curved posteriorly; 2 or 3 yellowish longitudinal bands. Length 280 mm. (Bleeker)

One in the National Museum, without locality, though likely from the East Indies or Polynesia, obtained by the Wilkes Expedition.

India, East Indies, Melanesia, Micronesia.

Pentapus nemurus (Bleeker).

Heterognathodon nemurus Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 754, 1852 (type loc., Macassar, Celebes).

Pentapus nemurus Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 121, 1913 (Saonek, Waigiu).

Upper and lower caudal lobes end in long filaments. Scales 55 to 60. Broad median, yellowish, lateral band and narrow yellowish line above lateral line. Reaches 365 mm. with filaments, according to Bleeker.

East Indies.

Pentapus hellmuthii (Bleeker).

Heterognathodon hellmuthii Bleeker: Nat. Tijds. Ned. Ind., vol. 5, p. 75, 1853 (type loc., Lawajong [Solor]).

Heterognathodon hellmuthi Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 2, 1859 (Doreh, New Guinea).

Differs from the preceding species in having a brown median lateral band from the snout through eye to caudal base, bordered narrowly with yellow. Length 148 mm. (Bleeker)

East Indian region.

SPARIDAE

SPARINAE

Sparus berda Forskål.

Sparus berda Forskål: Descriptiones animalium, p. 32, 1775 (type loc., Arabia).

Sparus dentex (non Linné?) Jouan: Soc. Cherbourg, Mem., vol. 8, p. 262, 1861 (Port de France, Uitoë, Kanala, New Caledonia).

Chrysophrys novae-caledoniae Castelnau: Zool. Acclimat. Soc. Victoria, Proc., vol. 2, p. 110, 1873 (type loc., Noumea, New Caledonia).

Chrysophrys hasta Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 265, 1883 (Gulf of Papua).

Head 3; depth 2 1/3; D. XI or XII, 11 or 12; A. III, 8 to 10; scales 44 to 46 in lateral line, 6 above, 13 below; eye 3 to 4 in head, 1 1/4 to 1 1/2 in snout. Upper molars in 4 rows, lower in 3, largest of upper last of inner series. Silver-gray; scales darkest basally. Usually black spot behind opercle and on shoulder. Dorsals and caudal with black borders and dark band on anal. Sometimes brown bands radiate from eye. Reaches 762 mm. (Day)

Chrysophrys novae-caledoniae is evidently the same. It is described as uniform silvery, with the outer parts of the vertical fins and ventral more obscure.

Red Sea, India, East Indies, Formosa, China, Japan, Queensland.

Sparus australis (Günther).

Chrysophrys australis Günther: Cat. fishes Brit. Mus., vol. 1, p. 494, 1859 (type loc., Port Essington, Port Jackson and Harvey River [fresh water], Australia).—De Vis: Linn. Soc. New South Wales, Proc., vol. 8, p. 457, 1883 (Api, New Hebrides).

Eye 4 2/3 in head. Silvery, with shining golden longitudinal streaks. Edge of spinous dorsal and axil black. Length 408 mm. (Günther)

Although the above is quoted from Günther's original account McCulloch says "body without longitudinal stripes" (Australian Zool., vol, 2, pt. 3, p. 87, Feb. 10, 1922).

Australia, Melanesia.

Pagrosomus auratus (Houttuyn).

Scomber auratus Houttuyn: Hollandsche Maatsch. Haarlem, Verh., vol. 20, pt. 2, p. 331, 1782 (type loc., Japan).

Pagrosomus auratus Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).

Sparisomus unicolor Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 502, 1900 (Hawaiian islands).

Head 3 1/4; depth 2 4/5?; D. XII, 10, 1; A. III, 8, 1; scales 57 in lateral line to caudal base and 3 more on latter; 9 above, 13 below, 35 predorsal extending forward opposite front eye edges; snout 2 1/2 in head; eye 3 1/3; maxillary 2 2/3; interorbital 4.

Body well compressed, oblong. Least depth of caudal peduncle 1 3/5 in its length or 3 1/4 in head. Head width 2 1/2 in its length. Snout compressed, width 1 1/4 in its length. Eye 1 2/5 in snout, about equals interorbital, center midway in head length. Mouth moderate, jaws even. Maxillary reaches opposite hind nostril, expansion 2 1/5 in eye. Anterior canines 4 above and 6 below; molars in 2 series in each jaw. Nostrils close together, posterior higher and slightly nearer anterior than eye. Interorbital moderately convex. Narrowest preorbital width very slightly less than eye. Preopercle edge entire. Gill rakers 2+10, short tubercles, half of gill filaments, which half of eye. Pseudobranchiae long as gill filaments.

Scales above lateral line in series parallel with its course, below in horizontal series. Cheek with 8 rows of scales to preopercle ridge, none on flange. Scales with 8 or 9 basal radiating striae, edge scalloped; 80 to 115 apical denticles, with 8 to 16 transverse series of disconnected basal elements; circuli very fine. Fourth dorsal spine 2 1/2 in total head length; third dorsal ray 2 4/5; third anal spine 3 1/8, third ray 3; caudal deeply forked, lobes pointed, 1 1/8 in head; pectoral 1; ventral 1 2/5.

Back pale brown, sides and below paler with silvery reflections. Iris whitish. Fins all uniform pale brownish. Length 205 mm.

A single specimen, in poor condition, in the Academy from the Hawaiian islands, obtained by J. K. Townsend. Jordan and Evermann have identified this specimen with *Monotaxis grandoculis* though only as a poor guess. There is no

question about its identity with the Australian snapper.

Australia, New Zealand, China, Japan, Hawaii.

Monotaxis grandoculis (Forskål) (Pl. XVIII, *C*).

Sciaena grandoculis Forskål: Descriptiones animalium, pp. 12, 53, 1775 (type loc., Djedda, Red Sea).

Sphaerodon grandoculis Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 67, 1874 (Hawaiian islands, Society Islands, Friendly Islands, Samoa, Kingsmills, Hervey Islands, Pelew Islands).—Günther: Rept. voyage "Challenger," vol. 1, pp. 34, 56, 1880 (Kandavu, Fiji; Nares Harbor, Admiralty Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 264, 1883 (Engineer Group, New Guinea).—Waite: Australian Mus., Mem., no. 3, p. 186, 1897 (Funafuti, Ellice Islands).—Steindachner: Akad. Wiss. Wien, Denks., vol. 70, p. 487, 1901 (Honolulu).

Monotaxis (*Sphaerodon*) *grandoculis* Peters: Akad. Wiss. Berlin, Monatsb., p. 834, 1876 (1877) (Carteret Harbor, New Ireland).

Monotaxis grandoculis Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 453, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 527, 1902 (1904) (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 243, fig. 101, 1903 (1905) (Honolulu, Kailua, Hoopuloa, Hawaii).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 46, 1906 (Tubuai; Tahiti; Shortland Island).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 271, 1905 (1906) (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 291, 1911 (Arhno, Marshalls).—Fowler: Copeia, no. 112, p. 83, November 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 26, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 15, 1925 (Wake Island).

Lethrinus latidens Valenciennes: Hist. nat. Poiss., vol. 6, p. 236, 1830 (type loc., New Guinea).

Sphaerodon heterodon Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Kandavu).—Regan: Zool. Soc. London, Proc., vol. 1, p. 403, 1909 (Christmas Island, Indian Ocean).

Sphaerodon euanus Günther: Ann. Mag. Nat. Hist. London, 5th ser., vol. 4, p. 137, 1879 (type loc., Eua, Friendly Islands).

Head 3; depth 2 2/5; D. X, 10, 1; A. III, 9, 1; scales 45 in lateral line to caudal base and 5 more on latter; 6 scales above lateral line, 16 below; 8 predorsal scales; snout 2 in head; eye 5; maxillary 2; interorbital 2 3/5. Least depth of caudal peduncle 2 2/5 in head. Head width 2 in its length. Fifth dorsal spine 2 1/2 in head; sixth dorsal ray 1 7/8; third anal spine 2 9/10; fourth anal ray 1 5/6; caudal 1 1/4; pectoral 1 1/8; ventral 1 1/4.

Largely olive-brown, nearly uniform on head and trunk. Pectoral axil with black and few small black spots. Membranes of dorsals and anals dusky, with black blotch at bases of first 5 of soft dorsal rays and on second to fifth on soft anal. Other fins deep brown. Length 558 mm.

The Bishop Museum contains 13 from Honolulu, 3 Shortland Island, 1 Rarotonga and 1 Tubuai. In the Honolulu markets I found 4 December 9, 1922, 1 December 21, 1 December 22. One secured by the Tanager Expedition at Wake Island. The National Museum contains 4 from Hawaii, 2 Apia, 1 Arhno. In the Agassiz Museum adult from Ebon Island, Marshall Islands from Rev. B. G. Snow, April 14, 1877, 3 Society Islands and 2 Apiang in the Gilbert Islands, both from Andrew Garrett. One Hawaiian specimen in the Academy.

Sphaerodon euanus is evidently a variant. It is based on a specimen 330 mm. long, with 10 anal rays, 5 scales above lateral line and 51 in latter and pectoral without black base.

Jouan describes incompletely a *Sparus* (Soc. Cherbourg, Mem., vol. 9, p. 113, 1863) which may pertain to this species. It is based on a small specimens 70 mm. long from Tinaka, east coast of New Caledonia. It differs, however-, in that the head is said to be scaleless, D. XIII, 12, caudal but slightly emarginate and color blackish. Its snout is given as obtuse, large eye equals interorbital, mouth small, jaws equal, molars uniserial?, body with large scales, soft dorsal little higher than spinous fin and paired fins rather large.

Red Sea, Ceylon, East Indies, Melanesia, Micronesia, Polynesia, Hawaii.

DENTICINAE

The nominal *Dentex gobioides* Valenciennes (Hist. nat. Poiss., vol. 6, p. 173, 1830) is based on a drawing by Parkinson of specimen from Tahiti. *Perca gobioides* (Solander) Valenciennes (op. cit.) is simply a name quoted from the same. It is briefly noticed as follows:

D. X, 11; A. III, 9. Body blue. Opercles yellow. Dorsal black, bordered with red. Pectorals red. Length 279 mm.

Another nominal form has been noticed imperfectly under *Dentex waigiensis* Quoy and Gaimard (Voyage "Uranie," Zool., p. 302, 1824, type loc., Waigiu and Rawak). The following is gathered from the original account: Depth 3 6/7; D. X, 9; A. III, 9. Body compressed. Head large. Snout elongate, pointed. Eye large. Jaws equal, upper with 4 canines. Scales large, little serrated. Lateral line feebly curved. Caudal forked. Pectorals very long, pointed. Ventrals with triangular scales at insertion. Silvery-white, mixed brown spots more tinted on snout and fin bases than tail. Iris golden. Length 115 mm.

Smaris? oceaniae Thiollière (Fauna Woodlark, p. 161, 1857, type loc., Woodlark Island) is another doubtful name, with equally doubtful incomplete account. Though compared with *Lethrinus genivittatus* it has dimensions suggestive of *Dentex gracilis* Bleeker. The few items are as follows:

Head 4; depth 4 1/2. Body and form very slender. Head increased in length by opercle, which ends in point, of which remainder scaly. Snout very pointed. Eye placed low, well behind angle of jaws, long as mouth cleft. Jaws naked in front, very long. Gray-white, back more sombre, with dusky crescentic streaks forming lozenges on back to tail. Length 195 mm.

Jouan describes an unidentifiable *Sparus* or

Dentex from Port de France, Uitöe and Kanala, New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 262, 1861):

D. XI, 10; A, III, 8. Body very compressed, gibbous, flattened and nearly straight above. Head and mouth small. Snout pointed. Eye moderate, 1 1/2 in interorbital. Upper jaw little longer. Canines 4 in front of each jaw and many rows of molars in pavement. Scales large, ciliated. Cheeks and opercles scaly. Lateral line parallel with back. Dorsal spines stronger than rays. Second anal spine very long, first very short, fin partly scaly. Pectoral pointed, reaches beyond half of body. Silvery. Length 350 mm.

Dentex ruber Valenciennes.

Dentex ruber Valenciennes: Hist. nat. Poiss., vol. 6, p. 184, 1830 (type loc., East Indies; Waigiu).—Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 187, pl. 31, fig. 2, 1830 (Waigiu).

Head 3; depth 3; D. X, 10; A. III, 7; snout 3 1/10 in head; eye 3 3/4, 1 1/4 in snout; maxillary 2 3/5 in head, reaches front pupil edge, expansion 1 3/5 in eye; jaws even; canines 6 above and 6 below anteriorly; lower preorbital ridge denticulate, its least width 1 4/5 in eye; preopercle ridge entire; cheek with 4 rows of scales; fourth dorsal spine 2 2/3 in head, last ray 3, spinous membrane not notched marginally; third anal spine 3 3/4, last ray 2 1/2; caudal 1, forked; pectoral 1 1/3; ventral 1 2/3; fins without filaments. Violet-brown above, tinged with rose, silvery below. Fins flesh-red, ends yellow. Iris yellow. Length 128 mm. (Lesson)

Dentex furcosus Valenciennes.

Dentex furcosus Valenciennes: Hist. nat. Poiss., vol. 6, p. 181, 1830 (type loc., Trinquemale, Ceylon).

Synagris furcosus Günther: Cat. fishes Brit. Mus., vol. 1, p. 373, 1859 (Chaumont Island, Louisiades; Darnley Island).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 262, 1883 (Moresby Island, New Guinea).

Dentex marginatus Valenciennes: Hist. nat. Poiss., vol. 6, p. 182, 1830 (type loc., Vanicolo).

Dentex taeniopterus Valenciennes: Hist. nat. Poiss., vol. 6, p. 183, 1830 (no type locality).

Synagris notatus Ramsay and Ogilby: Linn. Soc. New South Wales, Proc., 2nd ser., vol. 1, p. 8, 1886 (Strickland River, New Guinea).

Upper canines 6 to 8. Preopercle entire. Fin rays not produced. Rosy, with brilliant spot on first 5 scales below lateral line, upper half red and lower yellow. Below lateral line 5 or 6 longitudinal yellow bands and 3 silvery-white ones. Fins pinkish, yellow band along dorsal and anal bases. (Day)

Both *Dentex marginatus* and *Dentex taeniopterus* are described with 8 canines. *D. marginatus* is based on a specimen 178 mm. long, red above and silvery below, the red fins uniform except black border in fork of caudal. *D. taeniopterus* is described as red, with 2 or 3 golden bands, and dorsal and anal with yellow band.

Andamans, East Indies, Queensland, Melanesia.

Dentex nemurus Bleeker.

Dentex nemurus Bleeker: Soc. Sci. Ind. Neerl., Act. (Amboina), vol. 2, p. 49, 1857 (type loc., Amboina).—Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).

Upper canines 6. Hind preopercle edge minutely serrate. Upper caudal lobe ends in filament. Red above, white below. Fins rosy, dorsals edged yellow. Row of yellow spots along anal basally. Length 225 mm. (Bleeker)

East Indies.

Dentex tolu Valenciennes.

Dentex tolu Valenciennes: Hist. nat. Poiss., vol. 6, p. 184, 1830 (type loc., Pondicherry; New Guinea).—Bleeker: Atlas ichth., vol. 8, p. 88, pl. (37) 315, fig. 1, 1876-77 (New Guinea).

Upper canines 4 to 6 anteriorly, none in mandible; lateral conic teeth in either jaw. Preopercle entire. Dorsal spines elongated and membranes each with deep notch. Fins without filaments. Rosy, with 4 or 5 yellowish longitudinal bands between rows of scales from immediately above pectoral base. Fins pinkish, dorsal spines tipped orange. (Day)

Possibly the incomplete notice of *Sparus* or *Pagrus* by Jouan (Soc. Cherbourg, Mem., vol. 8, p. 263, 1861, Port de France, New Caledonia) may refer to this species. The following may be gathered from the imperfect notice: Depth 3; D. X, 9; A. III, 7; head large, front gently inclined; eyes large; jaws equal, upper somewhat protractile; small teeth in many rows; median incisors conic; posterior teeth not molar. Caudal very forked. Red with rose sheen, below white. Iris carmine. Length 180 mm. without caudal.

India, East Indies.

Symphorus forsteri (Schneider).

Sparus forsteri Schneider: Systema ichth., Bloch, p. 282, 1801 (type loc., Tongatabu).

Sparus striatus (Forster) Schneider: Systema ichth., Bloch, p. 282, 1801 (name in text).—Lichtenstein: Descriptiones animalium, Forster, p. 184, 1844 (same type).

Symphorus taeniolatus Günther: Ann. Mag. Nat. Hist. London, 4th ser., vol. 9, p. 438, 1872 (type loc., Celebes).

Depth, little more than head, 3; D. X, 10; A. III, 9; scales 55 in lateral line, 9 above, 20 below; eye 5 in head; maxillary reaches little beyond front eye edge; interorbital not much more than eye. Cheek with 10 rows of scales. Dorsal spines rather short, feeble, third to ninth subequal, 4 in head, tenth longest; soft dorsal elevated, third to sixth rays produced in long filaments; anal spines feeble, third nearly thrice second, rays long, especially third which filamentous; caudal emarginate; pectoral reaches vent; ventral not produced as filament.

Olive, fins with reddish tinge. Body with 7 narrow, slightly oblique and undulating bluish bands, edged darker; narrower parallel stripe of same color between every pair of bands; bands and stripes continued along side of head, but more regular and broken up in their course. Membranes of soft vertical fins with round violet spots large as pupil. Length 305 mm. (Günther)

Although in the original account the body is said to have 20 lines, the D. XII, 21 and the A. III, 15, the increased number of rays is due to counting the simple ones, which are omitted by Günther.

East Indies, Polynesia.

Symphorus spilurus Günther.

Symphorus spilurus Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 61, 1874 (type loc., Pelew Islands [err. typog.]).

Symphorus spilurus Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, pl. 67 [not pl. 47 as quoted in text],

1874.—Schmeltz: Mus. Godeffroy, Cat. 6, p. 12, 1877 (Pelew Islands).

Differs from *S. fosteri,* of which it may be a variant, in the black ocellus on the upper half of the caudal peduncle, fins all uniform and yellowish-white band between eyes and another from occiput to pectoral axil.

GIRELLIDAE

Girella nebulosa Kendall and Radcliffe.

Girella nebulosa Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 120, pl. 3, fig. 2, pl. 4, fig. 1-2, 1912 (type loc., Cook Bay and La Perouse Bay, Easter Island).

Girellops nebulosus Regan: Zool. Soc. London, Proc., p. 369, pl. 57, 1913 (Easter Island).—Fuentes: Mus. Nac. Chile, Boletin, vol. 7, no. 1, p. 298, pl. 5, figs. a-b, 1914 (Easter Island).

Head 3 to 3 1/8; depth 3 to 3 1/4; D. XVI, 12, 1; A. III, 10, 1; scales 70 in lateral line to caudal base; snout 3 1/2 to 3 2/3 in head; eye 3 to 3 1/8; maxillary 3 1/5 to 3 7/8; interorbital 4 1/8 to 4 3/4.

Body compressed, elongately ovoid, deepest at spinous dorsal origin. Caudal peduncle strongly compressed, least depth equals its length or 2 1/5 to 2 1/4 in head. Head width 2 1/5 to 3 in its length. Snout obtuse, length 4/5 to 1 in its width. Eye with hind pupil edge midway in head length; diameter greater than snout or interorbital. Mouth small, lower jaw slightly shorter. Maxillary reaches front eye edge. Lips broad, largely conceal teeth. Teeth rather large, wide, compressed, trilobate incisors. Front nostril close before eye and hind one elevated, over front eye edge. Interorbital convex. Preopercle edge entire. Gill rakers 4+14, lanceolate, 4/5 of gill filaments, which half of eye. Scales with 5 or 6 basal radiating striae; apical denticles 8 to 10; circuli coarse. Lateral line arched, midway along side of caudal peduncle. First dorsal spine 5 in head; sixteenth dorsal spine 2 to 2 2/5; second dorsal ray 1 1/2 to 1 3/4; third anal spine 2 1/5 to 2 3/4; third anal ray 1 2/5; caudal 1 1/5 to 1 1/4, slightly emarginate behind; pectoral 1 2/5; ventral 1 2/5.

Dark olive-brown, scarcely paler below. Trunk with 7 dark vertical cross lines. Vertical fins dark, with some dusky specks or mottlings. Pectoral pale olive. Ventral dusky. Length 33 to 35 mm.

In the Agassiz Museum 8 from Easter Island, obtained by the *Albatross,* largest 95 mm. The National Museum has the type from Cook Bay, also 2 paratypes and 1 from Perouse Bay.

KYPHOSIDAE

Kyphosus cinerascens (Forskål).

Sciaena cinerascens Forskål: Descriptiones animalium, pp. 12, 53, 1775 (type loc., Arabia).

Pimelepterus cinerascens Bleeker: Atlas ichth., vol. 9, p. 15, pl. (2) 364, fig. 4, 1877 (New Guinea).

Kyphosus cinerascens Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 47, 1906 (Shortland Island).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 120, 1912 (Cook Bay, Easter Island).—McCulloch: Australian Mus., Records, vol. 13, pt. 2, p. 59, 1920 (Port Moresby).

Pachymetopon squamosum Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 275, pl. 9, fig. 1, 1877 (type loc., Hall Sound, New Guinea).—Macleay: op. cit., vol. 4, p. 62, 1879 (Solomons).—Macleay: op. cit., vol. 7, p. 246, 1882 (New Guinea).

Head 3 2/5 to 3 1/2; depth 2 1/8; D. XI, 12, 1; A. III, 11, 1; scales 63 or 64 counted close along and above lateral line to caudal base; tubular scales 49 to 56 in lateral line and 7 to 9 more on latter; 11 scales above lateral line, 18 below, 55 to 63 predorsal; snout 3 to 3 1/10 in head; eye 3 1/2 to 3 4/5; maxillary 3 to 3 1/4; interorbital 2 2/3 to 3.

Body strongly compressed, elongately ovate, predorsal scarcely with median keel. Caudal peduncle strongly compressed, least depth 1 1/3 in its length or 2 1/8 to 2 1/6 in head. Head width 1 3/5 in its length. Snout convex, length 7/8 its width. Eye with hind pupil edge midway in head length; diameter 1 1/3 in snout, 1 2/5 in interorbital. Mouth small, lower jaw slightly shorter. Maxillary reaches eye; expansion 2 1/2 in eye. Teeth uniserial, compressed, ends pointed, entire. Nostrils rather close together; anterior at last third in snout length; posterior about midway between front one and eye. Interorbital broadly convex. Preopercle edge minutely and feebly serrated, flange also finely crenulated. Gill rakers 9 or 10+18 to 20, lanceolate, 1 1/3 to 1 1/2 in gill filaments, which 1 2/3 to 2 1/3 in eye. Scales with 5 or 6 basal radiating striae, edge scalloped; apical denticles 87 to 90 and 4 to 6 transverse series of basal elements; circuli very fine. Cheek with 11 transverse rows of scales. Suprascapula crenulated, edge entire. Fifth dorsal spine 2 1/2 in head; fifth dorsal ray 1 9/10; third anal spine 3 2/3; third anal ray 1 3/4; pectoral 1 2/5 to 1 1/2; ventral 1 2/5 to 1 3/5; caudal deeply emarginate, 3 1/5 in combined head and trunk.

Back olive-brown, sides and lower surface lighter to whitish. Gray-white streak from preorbital close along and below eye. Fins all brownish. Iris pale brownish. Length 193 mm.

In the Agassiz Museum 1 from the Society Islands, obtained by Andrew Garrett September 29, 1861. Also an adult from Ponapé 267 mm. long. In the Bishop Museum 3 from Shortland Island, 180 to 222 mm. One in the National Museum from Cook's Bay on Easter Island.

Pachymetopon squamosum Alleyne and Macleay is a synonym.

Distinguished by the soft dorsal higher than the spinous dorsal.

Red Sea, Zanzibar, Reunion, India, East Indies, Japan, Melanesia, Easter Island.

Kyphosus lembus (Cuvier).

Pimelepterus lembus Cuvier: Hist. nat. Poiss., vol. 7, p. 201, 1831 (type loc., Vanicolo).

?Oblata muador Thiollière: Fauna Woodlark, p. 161, 1857 (type loc., Woodlark Island).

Kyphosus cinerascens (non Forskål) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 47, 1906 (Faté; Shortland Island).

Head 3 2/3 to 4 1/8; depth 2 1/8 to 2 1/4; D. XI, 14, 1; A. III, 13, 1, rarely 12, 1; scales 70 to 75 in lateral line to caudal base and 10 more on latter; tubular scales 50 to 55 in lateral line to caudal base and 9 or 10 more on latter; 11 to 13 scales above lateral line, 16 to 19 below; 66 to 70 predorsal scales; snout 3 1/10 in head; eye 3 2/3 to 4; maxillary 3 1/10 to 3 1/2; interorbital 2 1/3 to 2 1/2. Least depth of caudal peduncle 2 1/6 to 2 1/4 in head. Head width 1 2/3 to 1 3/4 its length. Gill rakers 8 to 10 + 17 to 22, lanceolate, slender, 1 1/4 in gill filaments or 1 7/8 in eye. Seventh dorsal spine 2 1/4 in head; third dorsal ray 2 2/3 to 3 1/4; third anal spine 3 3/4 to 4 3/4; second anal ray 2 1/4 to 2 2/3; caudal little longer than head; pectoral 1 2/5 to 1 1/2; ventral 1 2/5 to 1 1/2. Dark streak or line down each row of scales distinct. Length 51 to 311 mm.

In the Bishop Museum 1 Shortland Island, 1 Faté, 1 Honolulu and 1 Laie Stream on Oahu

taken November 5, 1922, by Dr. and C. Montague Cooke. In the Agassiz Museum 1 from Ebon Island in the Marshalls, 253 mm.

Differs from *Kyphosus fuscus* in more dorsal rays (14 compared with 12) also more anal rays (13 compared with 11). *Oblata muador* Thiollière may be this species, but is so briefly noticed as to leave doubt. The few items are as follows: Silvery with indistinct dusky streaks along back and 2 blue streaks below eye.

Zanzibar, East Indies, Melanesia.

Kyphosus fuscus (Lacépède) (Pl. XVII, *C*).

Xyster fuscus Lacépède: Hist. nat. Poiss., vol. 5, pp. 484, 485, 1830 (no type locality [on Commerson]).

Pimelepterus fuscus Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, p. 306, 1868 (Savay).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 68, 1874 (Tahiti; Hawaii).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 489, 1901 (Honolulu; Laysan).

Kyphosus fuscus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 248, 1903 (1905) (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 51, December, 1922 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 26, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 15, 1925 (Necker, Laysan, Lisiansky and Johnston islands).—Fowler: op. cit., Bull. 38, p. 15, 1927 (Washington, Howland and Baker islands).

Kyphosus elegans Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 131, 1901 (1903) (Marcus Island).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 453, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 527, 1902 (1904) (Laysan Island).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 51, 1922 (Honolulu).

Pimelepterus sandwicensis Sauvage: Soc. Philom. Paris, Bull., 7th ser., vol. 4, p. 221, 1879 (type loc., Hawaiian islands).

Kyphosus sandwicensis Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 247, 1903 (1905) (Honolulu).

Head 3 3/4; depth 2 1/4; D. XI, 12, 1; A. III, 11, 1; scales 80 in lateral line to caudal base and 10 more on latter; tubular scales 55 in lateral line to caudal base and 8 more on latter; 12 scales above lateral line, 20 below; 73 predorsal scales; snout 3 in head; eye 4 4/5; maxillary 3 1/10; interorbital 2 2/5. Least depth of caudal peduncle 2 4/5 in head; head width 1 7/8. Gill rakers 9+18, lanceolate, slender, 1/2 of gill filaments or of eye. Seventh dorsal spine 2 3/5 in head; third dorsal ray 2 1/3; third anal spine 4 1/4; second anal ray 2; caudal 1; pectoral 1 2/5; ventral 1 3/5.

In the Bishop Museum 8 from Honolulu and 2 from Marcus Island. These are remarkable for their very great variation in color. All the large examples are either partly or entirely brilliant lemon-yellow, one with piebald appearance intermediate with the dark or dusky form. Most small specimens are dusky. In the Honolulu markets I examined 148 specimens during November and December 1922. One was found at Laie Beach, Oahu, November 5, 1922. Two from Necker Island and 3 from Johnston Island, collected by the Tanager Expedition in 1923. Largest specimen 507 mm. In the National Museum 1 from Oahu obtained by the Wilkes Expedition. The *Albatross* also collected 2 at Honolulu.

Polynesia, Hawaii.

Kyphosus vaigiensis (Quoy and Gaimard).

Pimelepterus vaigiensis Quoy and Gaimard: Voyage "Uranie," Zool., p. 386, pl. 62, fig. 4, 1825 (type loc., Iles des Papous; Ile Bony).

Pimelepterus waigiensis Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Savay).—Schmeltz: op. cit., Cat. 5, p. 24, 1874 (Savaii; Tahiti).—Günther; Mus. Godeffroy, Jour., vols. 3-4, pts. 5-6, p. 68, 1874 (Pelew Islands).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 12, 1877 (Pelew Islands).—Bleeker; Atlas ichth., vol. 9, p. 17, pl. (2) 364, fig. 2, 1877 (New Guinea; Waigiu).—Günther: Rept. voyage "Challenger," vol. 1, p. 56, 1880 (Nares Harbor, Admiralty Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 264, 1883 (Engineer Group, New Guinea).—Günther: Rept. voyage "Challenger," vol. 3, p. 5, 1889 (north of New Guinea).

Kyphosus waigiensis Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 271, 1905 (1906) (Apia).

Pimelepterus marciae (Quoy and Gaimard) Cuvier: Hist. nat. Poiss., vol. 7, p. 199, 1831 (type loc., Boni, petite ile voisine da la Terre des Papous).

Head 3 1/2; depth 2 1/5; D. XI, 14, 1; A. III, 13, 1; scales 77 along close above lateral line to caudal base; tubular scales 56 in lateral line to caudal base and 8 more on latter; 12 scales above lateral line to spinous dorsal origin, 18 below, 50 predorsal; snout 3 1/6 in head; eye 3 3/5; maxillary 3 1/4; interorbital 2 4/5.

Body strongly compressed, elongately ovate, predorsal with slight median keel. Caudal peduncle strongly compressed, least depth 1 1/3 in its length or 2 1/3 in head. Head width 1 4/5 in its length. Snout convex, length 4/5 its width. Eye with hind pupil edge midway in head length; diameter 1 1/6 in snout, 1 1/3 in interorbital. Mouth small, lower jaw slightly shorter. Maxillary reaches eye, expansion 2 1/6 in eye. Teeth uniserial, compressed, ends pointed, entire. Nostrils rather close together; anterior at last third in snout; hind one midway between front one and eye. Interorbital convexly elevated. Preopercle edge entire, flange finely crenulated below. Gill rakers 10+20, lanceolate, 1 1/3 in gill filaments, which 1 1/2 in eye. Scales with 7 or 8 basal radiating striae; apical denticles 62 to 68, basal elements in 6 to 8 transverse series; circuli fine. Cheek with 17 transverse rows of scales. Suprascapula entire. Fifth dorsal spine 2 2/5 in head; first dorsal ray 2 3/5; third anal spine 4 1/2; first anal ray 2 1/2; caudal 1, deeply emarginate; pectoral 1 1/2; ventral 1 1/2.

Back olive-brown, sides and lower surface paler to whitish. Along side each row of scales with dark line longtitudinally, following in junctures of scales. Gray-white line from side of snout along lower eye edge. Iris pale yellowish. Fins all brownish, vertical ones with slightly lavender tinge. Length 157 mm.

In the Agassiz Museum 3 from Meos Boendi, Wiak Island, New Guinea, obtained by Thomas Barbour. Two in the National Museum from Apia.

This species is close to *Kyphosus lembus*, but more slender or depth 2 1/2 and with finer scales, about 75.

East Indies, Melanesia, Micronesia, Polynesia.

Sectator azureus Jordan and Evermann.

Sectator azureus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 185, 1902 (1903) (type loc., near Heeia, Oahu Island, Hawaii).—Jordan and Ever-

mann: op. cit., vol. 23, pt. 1, p. 248, pl. 20, 1903 (1905) (type).

Head 4; depth 3; D. XI, 15, 1; A. III, 13, 1; P. II, 18; scales 68 in lateral line to caudal base and 12 more on latter; 65 predorsal scales. Head width 1 2/3 in its length. Snout obtuse, convex, length 2/3 its width or 3 2/3 in head. Eye 1 1/4 in snout, 4 4/5 in head. Maxillary not quite reaching opposite eye, 4 in head. Interorbital convexly elevated, 2 1/6 in head. Gill rakers 8+20, lanceolate, 1 1/2 in gill filaments, which equal eye. Scales with 4 basal radiating striae, and about 65 apical series of striae. Tubes in lateral line small, largely concealed. Scales all small towards edges of body anteriorly. Faded brown in alcohol, with broad darker median lateral band. Length 368 mm.

Only the type, from near Heeia, Oahu, in the National Museum known.

HISTIOPTERIDAE

Histiopterus typus Schlegel (Pl. XIX, *A*).

Histiopterus typus Schlegel: Fauna Japonica, Poiss., pts. 5-6, p. 86, pl. 45, 1844 (type loc., Nagasaki).—Günther: Zool. Soc. London, Proc., p. 132, 1877 (Duke of York Island).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 47, December, 1922 (cast in Bishop Museum).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 1, p. 384, 1923 (Hilo).

Head 2 9/10; depth 1 5/6; D. IV, 28; A. III, 13; P. II, 15; V. I, 5; scales 91 counted close along and above course of lateral line to caudal base and 7 more on latter (of larger size); tubes 69 in lateral line to caudal base and 3 more on latter; 13 scales above lateral line to spinous dorsal orgin, 13 above to base of eleventh dorsal ray, 33 below to spinous anal origin; 24 predorsal scales to occiput; snout 1 5/6 in head; eye 4 1/2; maxillary 2 3/5; interorbital 3 2/5.

Body strongly compressed, back greatly elevated, compressed, profile steeply convex with greatest depth at ventral base, predorsal narrowly constricted though its edge not trenchant. Caudal penduncle well compressed, length 2/3 its least depth, which 2 2/5 in head.

Head compressed, width 2 1/10 in its length, upper profile greatly indented to form protruding subconic muzzle so profile of interorbital vertical, then slightly inclined from vertical to occiput and finally more inclined to spinous dorsal origin. Snout width at eye 1 3/4 in its length. Eye elevated, close to front profile of interorbital, front edge midway in head length. Mouth terminal, jaws about even; lips finely papillose, those at mandibular symphysis much longer and as dense cluster of moderately long barbels, nearly half of eye at chin. Maxillary little inclined from horizontal, reaches opposite front nostril or about 3/5 in snout length; expansion 2 in eye. Teeth conic, simple, uniform, in broad bands in front of jaws, narrowing to 1 or 2 series towards rictus; roof of mouth toothless; moderate upper inner buccal fold, lower very narrow. Tongue depressed, smooth, rather elongate and free in front. Mandibular rami low, robust, not elevated inside mouth. Nostrils separated, small, simple, alike; front one at last 2/5 in snout. Interorbital broadly convex. Hind preopercle edge vertical and like lower edge minutely roughened by fine rugosities all over flange and ridge. Opercle, interopercle and 2 exposed faces of shoulder girdle with rugose-striae, most coarse on opercle. Suprascapula, upper surface of snout, interorbital, narrow suborbital chain and cranial surfaces finely rugose-striate.

Gill opening extends forward opposite hind nostril. Gill rakers 4 + 18, low tubercles, finely asperous, 1/5 of gill filaments, which 1 1/4 in eye. Pseudobranchiae long as gill filaments. Isthmus compressed, narrowly constricted forward.

Scales usually with single basal radiating stria; apical denticles 70 to 80, small, low, basal elements in 7 to 13 series; circuli very fine. Scales rather irregular in exposures, narrowly imbricate, little smaller along body edges, bases of caudal, soft dorsal and soft anal; 12 rows on cheek transversely. Lateral line arched, nearly concurrent with dorsal profile and squamous area on soft dorsal; tubes simple, small, slender.

Spinous dorsal origin close behind that of pectoral, spines graduated to fourth which 1 1/2 in head, last but little over half first soft ray. Soft dorsal origin close behind ventral base, fin rounded, rays gradually shorter posteriorly so last very low; first 1 1/10 in head. Spinous anal origin much nearer caudal base than ventral origin, spines strong, compressed, graduated to third which longest, or about half of front rays, 2 4/5 in head. Soft anal rounded, graduated rapidly down to last rays; second anal ray 1 4/5 in head. Caudal moderate, upper lobe broader, hind edge emarginate, both lobes rounded; fin 1 2/5 in head. Pectoral moderate, reaches 1 1/2 to anal, upper rays longest; 1 1/3 in head. Ventral inserted close behind pectoral base, fin reaches 5/6 to anal, 1 1/4 in head; spine 2/3 of fin. Vent eye diameter before anal.

Color in alcohol pale brown. Seven broad blackish-brown crossbands, all little inclined backward; first includes muzzle; second extends from occiput to chest; third from front of spinous dorsal and hind predorsal embraces pectoral and ventral bases, joining behind with fourth, which extends from base of front dorsal rays to belly, its hind boundary at vent; fifth band from antero-median dorsal rays to spinous anal; sixth band embraces hind basal squamous area of soft dorsal to middle of anal base; seventh band transverse on caudal peduncle at caudal base; dorsal bands only slightly reflected on bases of rayed dorsal and anal. Pectoral pale, with brown base. Ventral blackish. Iris brown. Length 373 mm.

A single specimen in the Bishop Museum, obtained at Hilo.

ERYTHRICHTHYIDAE

Erythrichthys schlegelii Günther (Pl. XIX, *B*).

Erythrichthys schlegelii Günther: Cat. fishes Brit. Mus., vol. 1, p. 395, 1859 (on *Erythrichthys* Schlegel, Fauna Japonica, Poiss., pts. 7 to 9, p. 117, pl. 63, fig. 1, 1845, type loc., Nagasaki).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 245, fig. 102, pl. 19, 1903 (1905) (Hilo).—Fowler: B. P. Bishop Mus., Bull. 38, p. 16, 1927 (Honolulu).

Erythrichthys scintillans Jordan and Thompson: U. S. Nat. Mus., Proc., vol. 41, p. 599, 1912 (type loc., Hilo).

Five specimens in the Bishop Museum, from Honolulu, 216 to 393 mm. I also examined 2 in the Honolulu markets, December 15, 1922 and 5 December 3 . One Hawaiian specimen in the Agassiz Museum 253 mm.

A comparison of this material and the alleged differences set forth by the describers of *Erythrichthys scintillans* fails to show the latter a valid species. My specimens reveal measurements, formulae, proportion, etc., which would be common to the Japanese specimens described by Jordan and Thompson equally well.

GREGORYINIDAE

Gregoryina gygis Fowler and Ball (fig. 46).

Gregoryina gygis Fowler and Ball: Acad. Nat. Sci. Philadelphia, Proc., p. 270, 1924 (type loc., Laysan).

Gregoryina gygsis Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 15, 1925 (error, reference to type).

Only the type, No. 3415, Bishop Museum, from Laysan.

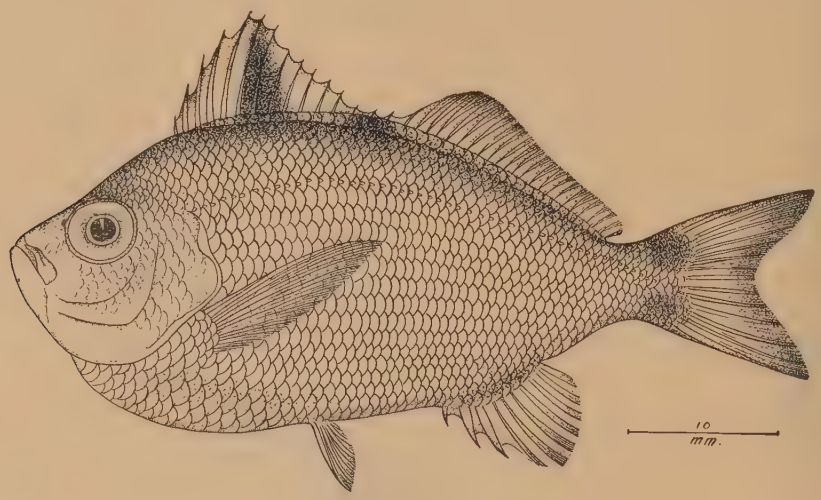

FIGURE 46.—Drawing of *Gregoryina gygis*.

GERRIDAE

Gerres abbreviatus Bleeker.

Gerres abbreviatus Bleeker: Nat. Tijds. Ned. Ind., vol. 1, p. 103, 1850 (type loc., Batavia, Java).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 239, 1882 (New Guinea).—Ramsay and Ogilby: Linn. Soc. New South Wales, Proc., 2nd ser., vol. 1, p. 9, 1886 (Strickland River, New Guinea).

Diapterus abbreviatus Bleeker: Atlas ichth., vol. 8, p. 127, pl. (78) 362, fig. 4, 1876-77 (Waigiu).—Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol 2, p. 299, 1868 (Waigiu).

Head 3 1/8; depth 1 7/8; D. IX, 10; A. III, 7; scales 37 to 40 in lateral line, 6 above, 11 below. Second dorsal spine 1 1/8 in head. Silvery-white, each scale of back with rather indistinct spot forming longitudinal bands. Fins yellowish. Dorsal with blackish edge and spot on each spine and ray just above sheath. (Day)

One from New Guinea in the National Museum, 206 mm.

Gerres acinaces Bleeker.

Gerres acinaces Bleeker: Nat. Tijds. Ned. Ind., vol. 6, p. 194, 1854 (type loc., Batavia, Java).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 240, 1882 (New Guinea).

Xystaema acinaces Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 291, 1911 (Funafuti, Ellice Islands; Vavau, Tonga).

Head 3 2/3; depth 2 2/3; D. IX, 10 or 11; A. III, 7 or 8; scales 43 in lateral line, 5 above, 11 below. Second dorsal spine 1 1/3 in head. Silvery-white. Fins all pale, hind caudal edge brown. Length 292 mm. (Bleeker)

In the National Museum 1 from Vavau and 3 from Funafuti. The Agassiz Museum has one from Vavau 146 mm.

Aden, Zanzibar, East Indies, Melanesia, Polynesia.

Gerres argyreus (Schneider).

Cichla argyrea Schneider: Sysetma ichth., Bloch, p. 344, 1801 (type loc., Tanna Island, Pacific Ocean).

Sciaena argyrea (Forster) Schneider: Systema ichth., p. 344, 1801 (name in synonymy).—Lichtenstein: Descriptiones animalium, Forster, p. 291, 1844 (Tanna Island).

Gerres argyreus Cuvier: Hist. nat. Poiss., vol. 6, p. 360, 1830 (Waigiu; Strong Island).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Upolu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 4, p. 60, 1879 (Solomon Islands).

Xystaema argyreum Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 51, 1906 (Faté, New Hebrides; Shortland Island, Solomons).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 272, 1905 (1906) (Apia; Pago Pago).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 291, 1911 (Funafuti, Ellice Islands).

Gerres vaigiensis Quoy and Gaimard: Voyage "Uranie," Zool., p. 292, 1824 (type loc., Rawak and Waigiu Island).

Head 3; depth 3; D. IX, 10; A. III, 7; scales 45 in lateral line. Premaxillary groove entirely scaleless, not reaching vertical to center of eye. Second dorsal spine 2 in head and twice second anal spine, which rather stronger, but not longer than third. Silvery. Top of dorsal blackish. (Günther)

The Bishop Museum has 7 from Faté and 2 from Shortland Island. Length 130 to 175 mm. In the National Museum 1 from the Bonin Islands obtained by William Stimpson, 175 mm. Also 1 from Funafuti.

Red Sea, East Indies, Melanesia, Polynesia.

Gerres macrosoma Bleeker.

Gerres macrosoma Bleeker: Nat. Tijds. Ned. Ind., vol. 6, p. 56, 1854 (type loc., Sindangole, Halmaheira).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 121, 1913 (Saonek, Waigiu).

Diapterus macrosoma Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).—Bleeker: Atlas ichth., vol. 8, p. 126, pl. (78) 362, fig. 5, 1876-77 (Waigiu).

Gerres (*Xystaema*) *macrosoma* Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1381, 1906 (Upolu).

Head 3 1/4; depth 2 7/8; D. IX, 10, 1; A. III, 7, 1; scales 40 in lateral line to caudal base and 4 more on latter; 4 scales above lateral line, 9 below, 15 predorsal; snout 3 1/3 in head; eye 3; maxillary 2 3/4; interorbital 3.

Body compressed, elongately ovate, deepest at spinous

dorsal origin, predorsal with slight median keel. Caudal peduncle well compressed, least depth 1 1/4 in its length or 3 in head. Head width 2 in its length. Snout convex, profile slightly protruded convexly in front, length 7/8 its width. Eye large, hind pupil edge midway in head length; diameter greater than snout or interorbital. Mouth small, closed jaws even. Maxillary reaches eye, expansion 2 1/4 in eye. Lips narrow, though rather thick and fleshy. Teeth villiform, in rather narrow bands in jaws; palate edentulous. Nostrils together; front one at last third in snout; hind one much larger, higher and close behind. Interorbital broadly convex. Gill rakers 5 + 9, rather short lanceolate points, half of gill filaments, which 2 2/5 in eye. Scales with 5 basal radiating striae; circuli extremely fine. Lateral line largely concurrent with upper body profile; tubes simple, well exposed. Second dorsal spine 1 2/3 in head; first dorsal ray 3 1/6; third anal spine 2 2/3; first anal ray 2 1/3; caudal 1, widely forked; pectoral 1 1/10; ventral 1 3/5.

Back pale olivaceous, sides and below silvery-white. Iris whitish. Fins all pale, margin of spinous dorsal dusky. Length 137 mm.

In the Agassiz Museum one from Ebon Island, Marshall Islands, obtained by the Rev. B. G. Snow in 1877. It is poorly preserved.

Gerres kapas Bleeker.

Gerres kapas Bleeker: Nat. Tijds. Ned. Ind., vol. 2, p. 482, 1851 (type loc., Batavia, Java).

Xystaema kapas Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 610, 1908 (Suva, Fiji).

Gerres bispinosus Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 273, pl. 7, fig. 3, 1875 (type loc., Hall Sound, New Guinea).—Jouan: Soc. Cherbourg, Mem., vol. 21, p. 333, 1877-78 (on *Gerres* Jouan, op. cit., vol. 8, p. 263, 1861, Port de France, New Caledonia).

Head 3 1/3 to 3 2/3; depth 2 2/3 to 2 3/4; D. IX, 10, 1; A. III, 7, 1; scales 37 to 39 in lateral line to caudal base and 3 or 4 more on latter; 5 scales above lateral line, 9 below, 19 or 20 predorsal; snout 3 to 3 1/5 in head; eye 3 1/5 to 4 1/4; maxillary 2 4/5 to 3; interorbital 2 4/5 to 2 7/8.

Body elongately ovoid, compressed. Least depth of strongly compressed caudal peduncle 1 1/4 to 1 1/3 in its length or 2 7/8 to 3 in head. Head width 1 7/8 to 2 in its length. Snout conic, length 4/5 to 7/8 its width. Eye midway in head, diameter equals snout or little longer, slightly less than interorbital. Mouth small, jaws even. Maxillary reaches opposite eye; expansion 2 1/5 to 2 2/3 in eye. Lips fleshy, rather narrow, smooth, firm. Teeth fine, villiform, in bands in jaws. Nostrils together; front one near last third in snout; hind one little longer and higher. Interorbital broadly convex, depressed forward and medianly. Preopercle and preorbital edges entire.

Gill rakers III, 2 + 7 or 8, short points 1/2 of gill filaments, which 1/2 of eye. Scales with 4 to 6 basal radiating striae and many as 7 incomplete alternating auxiliaries, edge scalloped; circuli very fine. Scales above lateral line in series parallel with its course, below in horizontal series; broad scaly dorsal and anal sheaths; axillary ventral scaly flap 3/4 of fin; caudal scaly basally, and terminally fin largely covered with minute scales; cheeks with 3 rows of scales and row on preopercle flange; muzzle naked and broad naked premaxillary area extends on front of interorbital opposite front eye edge. Lateral line largely concurrent with dorsal profile, median on caudal base; tubes all simple, well exposed. Third dorsal spine 1 2/5 to 1 3/5 in head; first dorsal ray 2 4/5 to 3; third anal spine 2 1/4 to 3; first anal ray 2 2/5 to 3; ventral 1 1/3 to 1 1/2; pectoral 3 1/4 to 3 1/3 in combined head and trunk; upper caudal lobe 3 1/5 to 3 2/5.

Back very pale olive, sides and below bright silvery-white. Very dull dusky margin to spinous dorsal, made up of minute dusky spots. Fins otherwise all pale brownish. Iris silvery-white. Length 170 to 180 mm.

In the Agassiz Museum 4 specimens from Apiang, Kingsmills, obtained by Andrew Garrett in 1860. None of these show any trace of a dark spot on each membrane of both dorsal fins, as in Bleeker's figure of *Diapterus poetie* (Atlas ichth., vol. 8, pl. [77] 361, fig. 1, 1876-77). All my specimens also have the third anal spine slightly longer than the second and equal to half length of second or third dorsal spines. In the National Museum 1 specimen 113 mm. long obtained by the Wilkes Expedition at Fiji. Three from Guam in the Bishop Museum, obtained in 1923. In the Academy 1 from Samoa 128 mm. through H. C. Caldwell.

Known by the large scales in the lateral line. Quite likely *Gerres bispinosus* is a synonym. It is described with 2 anal spines, evidently a variant. According to the figure the depth would be about 2 7/8 and the second dorsal spine about 1 3/4 in head. Scales 37 in lateral line. The detailed account by Jouan appears to be the same. His measurements would give the depth less than 3, the total length 180 mm. D. VIII, 10; A. II, 7; blue on back, silvery on flanks and below, longitudinal lines dull, ventrals yellow.

East Indies, Polynesia, Micronesia.

Gerres oyena (Forskål).

Labrus oyena Forskål: Descriptiones animalium, p. 35, 1775 (type loc., Suez and Djedda).

Gerres oyena Günther: Rept. voyage "Challenger," vol. 1, pp. 34, 58, 1880 (Kandavu, Fiji; Tongatabu).—Beaufort: Bijdr. Dierk., Amsterdam, vol. 19, p. 121, 1913 (Majalibit Bay, Waigiu).

Xystaema oyena Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 292, 1911 (Suva, Fiji; Tongatabu, Vavau, Tonga Islands; Guam; Truk and Moen, Carolines).

Head 3; depth 2 1/8; D. IX, 10; A. III, 7; scales 38 to 40 in lateral line, 5 above, 10 below. Second dorsal spine 1 2/5 in head. Silvery. Dorsal with black edge and dark median spot on each spine and ray. Hind caudal edge narrowly black medially. Other fins yellow. Length 191 mm. (Day)

In the National Museum 6 from Vavau, 24 Suva, 7 Moen, 7 Truk. In the Agassiz Museum 1 from Tonga and 3 Guam. Largest 121 mm.

Red Sea, Zanzibar, India, East Indies, Queensland, Micronesia, Polynesia.

Gerres poieti Cuvier.

Gerres poieti Cuvier: Regne animal, 2nd ed., vol. 2, p. 188, 1829 (on Renard, Poiss. Moluques Austral., pl. 11, fig. 1, 1718-19).

Gerres pocti Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 261, 1883 (River in Milne Bay, New Guinea).

Head 3 1/4; depth 2 1/5; D. IX, 10; A. III, 7; scales 40 in lateral line, 6 above, 11 below. Second dorsal spine 1 2/3 in head. Silvery. Dorsals with dark edges and outer caudal edge grayish. Spots along base of each dorsal spine and ray and more or less distinct

lines along rows of body scales. Length 179 mm. (Day)

Red Sea, East Africa, India, East Indies.

Gerres gigas Günther.

Gerres gigas Günther: Cat. fishes Brit. Mus., vol. 4, p. 262, 1862 (type loc., Tonga Islands).—Castelnau: Zool. Acclimat. Soc. Victoria, Proc., vol. 2, p. 117, 1873 (Noumea, New Caledonia).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 30, pl. 24, fig. A, 1874 (Friendly Islands; Fiji).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 239, 1882 (New Guinea).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 372, 1897 (Rotuma Island).—Fowler: B. P. Bishop Mus., Bull. 22, p. 10, 1925 (Guam).

Gerres (*Xystema* ?) *gigas* Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1380, 1906 (Upolu).

Xystaema gigas Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 272, 1905 (1906) (Apia).

Gerres macrosoma (non Bleeker) Kner: Akad. Wiss. Wien., Sitz., vol. 57, pt. 1, p. 301, 1868 (Bay of Palauli: Savay, Samoa).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Savay).

Garres argyeus (non Schneider) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 80, 1900 (1901) (Guam).

Head 3 1/5; depth 2 3/5; D. IX, 10, 1; A. III, 8; scales 43 in lateral line to caudal base and 3 more on latter; 7 scales above lateral line, 11 below; 30 predorsal scales; snout 2 2/3 in head; eye 4 1/2; maxillary 2 2/3; interorbital 2 4/5. Least depth of caudal peduncle 3 in head; head width 2. Snout conic, long as wide. Maxillary reaches eye; expansion 1 3/4 in eye. Gill rakers 5+11, short points, 1/3 of gill filaments, which 1 3/5 in eye. Occipital groove broadly scaleless. Scales with 4 or 5 strong basal radiating striae; circuli very fine. Third dorsal spine (broken) 1 2/5? in head; second anal spine 2 3/5; caudal 1; pectoral little greater than head; ventral 2. More or less uniform pale brown.

One in the Bishop Museum from Guam 394 mm. The National Museum has 1 from Tongatabu, 1 Fiji, 1 Samoa, 1 without locality, all from the Wilkes Expedition. Also an adult from Apia through the Bureau of Fisheries.

Differs from *Gerres macrosoma* in 6 or 7 scales above lateral line, as compared with 4 or 5, also with longer snout.

Jouan describes it as *Caesiomorus* or *Sparus* from Kanala, Uitoe and Port de France, New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 268, 1861):

D. IX, 10; A. III, 7. Body oval, nearly orbicular, depth little less than half of total. Head small, pointed. Eye very large. Mouth moderate. Teeth small. Jaws equal, upper very protractile. Preopercle edge vertical. Opercle not denticulate. Small isolated predorsal spine. First dorsal ray long filament. Second anal spine very strong. Pectoral long, pointed. Back blue, silvery on sides, many black longitudinal streaks. Length 160 mm.

Melanesia, Micronesia, Polynesia.

Gerres filamentosus Cuvier.

Gerres filamentosus Cuvier: Regne animal., 2nd ed., vol. 2, p. 188, 1829 (on *Wodawahah* Russell, Fishes of Coromandel, vol. 1, p. 52, fig. 67, 1803, type loc., Vizagapatam).—Peters: Akad. Wiss. Berlin, Monatsb., p. 832, 1876 (1877) (New Britain; New Hanover).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 120, 1913 (Bajon, Waigiu).

Diapterus filamentosus Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).—Bleeker: Atlas ichth., vol. 8, p. 124, pl. (78) 362, fig. 3, 1876-77 (New Guinea).

Gerres macracanthus Günther: Rept. voyage "Challenger," vol. 1, p. 56, 1880 (Nares Harbor, Admiralty Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 240, 1882 (New Guinea).

Head 3; depth 2 1/6; D. IX, 10; A. III, 7; scales 45 to 48 in lateral line, 6 above, 14 below. Second dorsal spine elongate filament reaching caudal fin. Silvery, with rows of short, oblong, horizontal, bluish spots along upper half of body. Spot at base or center of each dorsal ray and spine. Soft dorsal usually with dark edge. Caudal grayish externally. Other fins yellow. Reaches 204 mm. (Day)

One in the National Museum from New Guinea, 227 mm. long.

Readily known by the elongate second dorsal spine. *Gerres macracanthus* Bleeker was evidently based on immature examples, more slender and with dark vertical bands.

India, East Indies, Queensland, Melanesia.

OPLEGNATHIDAE

Oplegnathus fasciatus (Schlegel).

Scarodon fasciatus Schlegel: Fauna Japonica, Poiss., pts. 5-6, p. 89, pl. 46, figs. 1-2, 1844 (type loc., Nagasaki Bay).

Hoplegnathus fasciatus Steindachner: Akad. Wiss. Wien, Sitz., vol. 102, pt. 1, p. 222, 1893 (Honolulu).

Head 2 3/4; depth 2 2/5; D. XII, 16; A. III, 13; scales 130 to 140 in lateral series, 80 to 82 in lateral line, 30 above, 50 below to ventral origin; snout 2 3/5 in head; eye 4 4/5; interorbital little over 4; preorbital depth 1 1/6. Muzzle, preorbital and front of forehead scaleless. Fifth dorsal spine highest, 2 3/5 in head, third ray 2; second anal spine stronger, but not longer than third, third ray 1 2/3; caudal 1 1/4; pectoral 1 3/5; ventral 1 6/7. Gray-violet with metallic gloss, without trace of dark crossbars. Snout, dorsal edge and streak at pectoral base blackish. Length 472 mm. (Steindachner)

Japan, Hawaii.

MULLIDAE

Upeneoides vittatus (Forskål).

Mullus vittatus Forskål: Descriptiones animalium, pp. 10, 31, 1775 (type loc., Djedda, Red Sea).

Upeneus vittatus Cuvier: Hist. nat. Poiss., vol. 3, p. 329, 1829 (Society Islands).—Thiollière: Fauna Woodlark, p. 152, 1857 (Woodlark Island).—Jouan: Soc. Hist. Nat. Cherbourg, Mem., vol. 8, p. 295, 1861 (Canala and Port de France, New Caledonia).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1385, 1906 (Upolu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 51, 1906 (Tahiti; Nukuhiva).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 273, 1905 (1906) (Samoa).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 292, 1911 (Suva, Fiji).

Upeneoides vittatus Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Samoa; Viti).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 55, 1874 (Samoa; Tahiti).—Peters: Akad. Wiss. Berlin, Monatsb., p. 833, 1876 (1877) (New Britain).—Günther: Rept. voyage "Challenger," vol. 1, p. 35, 1880 (Kandavu, Fiji).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 245, 1882 (New Guinea).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 520, 1900 (Tahiti).—Fowler: B. P. Bishop Mus., Bull. 22, p. 37, 1925 (Tahiti).

Lota kumunikar (Montrouzier) Thiollière: Fauna Woodlark, p. 152, 1857 (name in synonymy).

The Bishop Museum contains 1 from Tahiti and 2 Nukuhiva. In the National Museum 1 from Suva and 1 from Apia. The Agassiz Museum has 1 from Strong Island, Carolines, 1 from Ebon Island, Marshall Islands, from Rev. B. G. Snow and one from the Society Islands, which like the first, received from Andrew Garrett. One in the Academy from Tahiti.

Red Sea, Zanzibar, Mauritius, India, East Indies, Japan, Melanesia, Polynesia, Micronesia.

Upeneoides arge (Jordan and Evermann) (Pl. XIX, *C*).

Upeneus arge Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 187, 1902 (1903) (type loc., Honolulu).—Jenkins: op. cit., vol. 22, p. 456, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 527, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 264, pl. 39, 1903 (1905) (Honolulu, Pearl Harbor, Hilo).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).

Upeneoides arge Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 52, December, 1922 (Hawaii).—Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., 4th ser., vol. 16, no. 2, p. 674 (poisonous as food).

Upeneoides vittatus (non Forskål) Streets: U. S. Nat. Mus., Bull., vol. 7, p. 71, 1877 (Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 151, 1902 (Hilo).

Upeneus punctatus (non Cuvier) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 18 (Hilo; name only).

In the National Museum the Wilkes Expedition obtained one at Hilo and 1 now without data, doubtless from Hawaii. Others are the type of *Upeneus arge* and 3 other Hawaiian specimens, one of which received from T. H. Streets. In the Bishop Museum 2 from Honolulu, 1 Hilo and 1 from Palmyra Island, obtained by C. Montague Cooke, Jr., in 1917. Largest 405 mm. I examined 276 specimens in the Honolulu markets in November and December, 1922, and January, 1923. The Agassiz Museum contains 2 from Honolulu of which 1 from W. H. Jones in 1874, 2 Hawaiian specimens from Andrew Garrett, 1 from Strong Island in the Caroline Islands from Rev. B. G. Snow, and 11 from Apiang in the Gilbert Islands from Andrew Garrett. One Hawaiian specimen in the Academy.

Differs from *Upeneoides vittatus* in the slightly smaller scales, though may eventually be found inseparable.

Upeneoides sulphureus (Cuvier).

Upeneus sulphureus Cuvier: Hist. nat. Poiss., vol. 3, p. 331, 1829 (type loc., Anjer, Straits of Sunda).—Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).

Upeneoides sulphureus Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 293, 1911 (Suva, Fiji).—Hase, Jena. Zeitsch. Nat., 51, 1914, p. 529, fig. 2 (dentition), fig. 3 (spinous dorsal) (Tami, Kaiser-Wilhelms-Land, New Guinea).

Golden band from orbit to upper third of tail. Dorsal with dark bands. Scales 36 to 38 in lateral line. (Day)

Mauritius, India, East Indies, Japan, Polynesia.

Upeneoides tragula (Richardson).

Upeneus tragula Richardson: British Assn. Adv. Sci., Rept. (Ichth. China, Japan), p. 220, 1846 (type loc., Canton).—Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 264, 1883 (Hood Bay, New Guinea).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 124, 1913 (Sorong, New Guinea).

Upeneoides tragula Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 245, 1882 (New Guinea).

Head and body with brown spots. Brown band from eye to caudal base. Dorsal and caudal with dark bands. Scales 20 to 32. (Day)

Aden, Zanzibar, Andaman Islands, East Indies, Philippines, China.

Upeneoides taeniopterus (Cuvier).

Upeneus taeniopterus Cuvier: Hist. nat. Poiss., vol. 3, p. 332, 1829 (type loc., Trinquemale, Ceylon).

Upeneoides taeniopterus Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 487, 1901 (Honolulu).

Back reddish, below whitish. Large triangular reddish blotch on caudal peduncle. Dorsals and caudal with brown bands. Scales 38. (Day)

Upeneichthys porosus (Cuvier).

Upeneus porosus Cuvier: Hist. nat. Poiss., vol. 3, p. 335, 1829 (type loc., Rivers of New Zealand).

Upeneichthys porosus Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Upolu).

D. VIII-9; A. 7; scales 28 in lateral line, 2 above, 6 below. Teeth in both jaws and on vomer, none on palatines. Barbels reach vertical from end of opercle. Two silvery streaks between eye and mouth, lower continued below and behind eye. (Günther)

Australia and New Zealand. Listed from Samoa.

Upeneus bifasciatus (Lacépède).

Mullus bifasciatus Lacépède: Hist. nat. Poiss., vol. 3, pp. 383, 404, pl. 14, fig. 2, 1802 (no type locality).

Upeneus bifasciatus Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 59, pl. 44, fig. A, 1874 (Rarotonga; Savaii; Solomons).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 52, Dec., 1922 (Honolulu).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 26, 33, 1925 (Honolulu; Samoa).—Fowler and Bean: U. S. Nat. Mus., Proc., vol. 71, p. 14, 1927 (Tahiti).

Pseudupeneus bifasciatus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 456, 1902 (1903) (Honolulu).—Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 128, 1902 (1903) (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, no. 1, p. 258, fig. 107, 1903 (1905) (Honolulu; Hilo; Kailua).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 51, 1906 (Rarotonga).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 274, 1905 (1906) (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 293, 1911 (Papeete, Tahiti).

Mullus trifasciatus Lacépède: Hist. nat. Poiss., vol. 3, pp. 383, 404, pl. 15, fig. 1, 1802 (no type locality).

Upeneus trifasciatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 72, 1901 (Agaña, Guam).

Upeneus semifasciatus Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 263, 1883 (type loc., Hood Bay, New Guinea).

[*Parupeneus andrewsii* Regan: Zool. Soc. London,

Proc., pt. 1, p. 403, pl. 65, 1909 (type loc., Christmas Island; Indian Ocean)].

Head 2 7/8; depth 3 1/3; D. VIII-1, 8, 1; A. II, 6, 1; scales 27 in lateral line to caudal base and 2 more on latter; 3 scales above lateral line, 6 below; 11 predorsal scales; snout 1 7/8 in head; eye 4 2/5; maxillary 2 1/2; interorbital 4. Least depth of caudal peduncle 3 1/3 in head; head width 2 1/4. Eye 2 1/3 in snout. Barbels extend only very slightly beyond hind preopercle edge or 4/5 to ventral edge. Gill rakers 8+25, lanceolate, 1 4/5 in eye, gill filaments 2/3 of gill rakers. Third dorsal spine 1 3/5 in head; first branched ray 2 3/4; first branched anal ray 2 7/8; caudal 1 1/5; pectoral 1 1/3; ventral 1 1/4. Largely faded uniform brownish, with very faint traces of dark blotch on back below each dorsal and on upper surface of caudal peduncle.

The Bishop Museum contains 9 from Honolulu, 3 Rarotonga, 1 Agaña on Guam, 3 Marcus Island, 1 Moilii on Oahu, 2 Hilo. Largest specimen 406 mm. I found 87 specimens in the Honolulu markets in November and December 1922. The National Museum has 2 from Samoa through Steinberger, 1 Hawaiian, 2 from Honolulu through T. H. Streets, 3 Apia, 1 Papeete. One in the Agassiz Museum from Hilo. The Academy contains 1 from Honolulu and 1 from Apia.

The species *Upeneus semifasciatus* is described with the eye 2 1/2 in the snout and the color red or yellow, with two broad brown bands extending from the back to below the middle of the sides, under the spinous and soft dorsal fins respectively. *Parupeneus andrewsii* is said to differ in having the second dorsal spine slender and flexible and the last soft dorsal and anal rays shortest of these fins. These hardly appear valid specific characters.

Reunion, New Guinea, Melanesia, Micronesia, Polynesia, Hawaii.

Upeneus porphyreus (Jenkins) (Pl. XX, *A*).

Pseudupeneus porphyreus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 454, fig. 22, 1902 (1903) (type loc., Honolulu).—Snyder: op. cit., vol. 22, p. 527, 1902 (1904) (Hanalei Bay, Kauai, Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 262, fig. 110, 1903 (1905) (Honolulu, Hilo).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 51, 1906 (Raiatea).

Upeneus porphyreus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 15, 1902 (Hilo).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 52, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 26, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 16 (Pearl and Hermes Reef, Laysan and Lisiansky).

Pseudupeneus barberinus (non Lacépède) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 49, 1906 (Faté, New Hebrides).

In the Bishop Museum 3 from Honolulu, 1 Raiatea, 2 Faté. I examined over 500 specimens in the Honolulu markets during November and December, 1922 and January, 1923. Also 2 from Pearl and Hermes reef, 2 Laysan and 2 Lisiansky. The National Museum has 1 without locality and 1 from Singapore or Polynesia obtained by the Wilkes Expedition. Also 2 from Honolulu through H. H. Pease, a series of Hawaiian specimens through the Bureau of Fisheries, 5 from Honolulu reef, 5 from Hanalei Bay on Kauai. One in the Agassiz Museum from the Hawaiian Islands. Also a Hawaiian specimen in the Academy.

Jenkins compared this species with *Pseudupeneus xanthospilurus* (Bleeker), apparently only the figure, though it is clearly in no way allied. Now Jenkins' types of *Pseudupeneus porphyreus* were 126 to 305 mm. long and comprised 17 specimens. He records but a single specimen of *Pseudupeneus bifasciatus* 216 mm. long. It is thus evident no comparison was ever carefully made, or by Jordan and Evermann later for that matter, who mention only 2 specimens, 279 mm and 305 mm. long, though they say "the collection contains other specimens from Honolulu, Hilo and Kailua." Jordan and Evermann set forth in their key that the eye is large in *Pseudupeneus porphyreus*. There is no way by which I can distinguish the young of *Upeneus bifasciatus* as the smallest specimens show the eye 3 4/5 and the adults have as much as 6 1/4 in the head. As for the short barbels of *Pseudupeneus porphyreus*, Jenkins says himself "the barbels, although generally not reaching the posterior margin of the preopercle, do in some cases." They are in no way different from the barbels of my specimens of *Upeneus bifasciatus*, which vary even to greater extent.

Upeneus multifasciatus (Quoy and Gaimard) (Pl. XX, *B*).

Mullus multifasciatus Quoy and Gaimard: Voyage "Uranie," Zool., p. 330, pl. 59, fig. 1, 1824 (type loc., Hawaiian islands).

Parupeneus multifasciatus Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

Upeneus multifasciatus Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 264, 1883 (Hood Bay, New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, p. 71, no. 3, 1900 (1901) (Guam).—Seale: op. cit., no. 5, p. 18, 1902 (Hilo).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 52, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 10, 26, 37, 1925 (Guam; Honolulu; Tahiti).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 15, 1925 (French Frigates Shoal, Laysan, Lisiansky).—Fowler: op. cit., Bull. 38, p. 16, 1927 (Laysan).

Pseudupeneus multifasciatus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 456, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 527, 1902 (1904) (Puako Bay, Hawaii; Laysan).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 256, pl. 22, 1903 (1905) (Honolulu, Hilo, Kailua, Laysan, Puako Bay).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 35, p. 122, 1912 (Cook's Bay, Easter Island).

Upeneus trifasciatus (non Lacépède) Cuvier: Hist. nat. Poiss., vol. 3, p. 344 (346), 1829 (Hawaiian islands; Carolines).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).—Kner: Reis. Novara, Fische, p. 71, 1865 (Tahiti).—Schmeltz: Mus.

Godeffroy, Cat. 4, p. 14, 1869 (Samoa).—Günther: Cruise of "Curaçoa," p. 409, 1873 (Solomons).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 59, pl. 44, fig. B (not C), 1874 (Polynesia; Hawaiian islands).—Streets: U. S. Nat. Mus., Bull., vol. 7, p. 71, 1877 (Honolulu).—Günther; Rept. voyage "Challenger," vol. 1, p. 59, 1880 (Honolulu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 245, 1882 (New Guinea).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 102, pt. 1, p. 238, 1893 (New Hebrides).—Boulenger: Ann. Mag. Nat. Hist. London, 6th. ser., vol. 20, p. 372, 1897 (Rotuma Island).—Waite: Australian Mus., Mem., no. 3, p. 185, 1897 (Funafuti, Ellice Islands).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 520, 1900 (Tahiti).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 16, 1902 (Hilo).

Upeneus atrocingulatus (Kner) Steindachner: Akad. Wiss. Wien, Sitz., vol. 61, p. 443, 1870 (type loc., Savay).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 29, 1869 (Savay).—Schmeltz: op. cit., Cat. 6, p. 12, 1877 (Vavao).

Upeneus velifer Smith and Swain: U. S. Nat. Mus., Proc., p. 130, 1882 (type loc., Johnston Island).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 18, 20, 1902 (Hilo).

Upeneus vilifex Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 15, 1902 (Hilo).

Pseudupeneus moana Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 274, 1905 (1906) (type loc., Apia, Samoa).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 48, 1906 (Tahiti, Tubuai, Mangareva, Rarotonga, Faté, Nukuhiva).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 354, 1916 (Tahiti).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 293, 1911 (Kusaie, Carolines).

Pseudupeneus bifasciatus (non Lacépède) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 51, 1906 (Faté).

The National Museum contains 1 from Maui and 1 from Tahiti, obtained by the Wilkes Expedition. Also 1 from Tahiti through W. H. Jones, June 12 to 15, 1883, 2 from the Bonin Islands from William Stimpson, 1 Kusaie, 10 Honolulu, 1 Cook's bay on Easter Island and 2 types of *Upeneus velifer* from Johnston Island. The Bishop Museum contains 37 from Honolulu, 1 Hilo, 3 Tahiti, 11 Papeete, 3 Faté, 1 Tubuai, 3 Rarotonga, 1 Agaña on Guam, 3 Nukuhiva and 2 Mangareva. Largest 292 mm. I found over 1200 in the Honolulu markets during November and December 1922 and January 1923. Two from French Frigates Shoal, 1 from Laysan, and 1 from Johnston Island by the Tanager, and 3 from Guam in 1923. The Agassiz Museum has 1 from Honolulu secured August 29, 1874 and 2 December-April 1874 through W. H. Jones, 4 from the Bureau of Fisheries and 18 from Andrew Garrett, 1 Kingsmill Islands and 14 Society Islands also from Andrew Garrett. The Academy has 9 Hawaiian specimens and 1 from Tahiti.

India, East Indies, Melanesia, Micronesia, Polynesia, Hawaii, Easter Island.

Upeneus spilurus Bleeker.

Upeneus spilurus Bleeker: Nat. Tijds. Ned. Ind., vol. 6, p. 395, 1854 (type loc., Nagasaki).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Kandavu).—Schmeltz: op. cit., Cat. 5, p. 23, 1874 (Viti Islands).

Parupeneus spilurus Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. (37) 63, pl. 2, fig. 3, 1878 (New Guinea).

Differs from *Upeneus multifasciatus* in that the last dorsal and anal rays are not produced. Side with 3 dark bands and 2 dark postocular spots.

Japan, New Guinea, Polynesia.

Upeneus barberinoides Bleeker.

Upeneus barberinoides Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 263 (type loc., Wahai, Northern Ceram).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 264, 1883 (Hood Bay, New Guinea).

Pseudupeneus barberinoides Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 293, 1911 (Vavau; Tonga).

Upeneus trifasciatus (part) Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 59, pl. 44, fig. C, 1874.

Head 3; depth 3 3/4; D. VIII-I, 8, 1; A. I, 6, 1; scales 27 in lateral line to caudal base and 2 more on latter; 3 scales above lateral line, 6 below, 12 predorsal; snout 2 1/5 in head; eye 4 1/3; maxillary 3; interorbital 4.

Body elongately ovoid, compressed, deepest at spinous dorsal origin. Caudal peduncle well compressed, least depth 2 in its length or 2 4/5 in head. Snout conic, compressed, profile convex, width 3 1/8 in its length. Eye elevated, front edge midway in head length; diameter 2 1/8 in snout, 1 1/10 in interorbital. Mouth small, jaws even. Maxillary reaches about 3/4 to eye; expansion 1 1/4 in eye. Teeth simple, conic, well spaced, uniserial in jaws; palate edentulous. Barbels not reaching much behind preopercle edge, 1 1/3 in head. Front nostril midway in snout length; hind nostril small, close on front eye edge. Interorbital broadly convex. Gill rakers 7+24, lanceolate, slightly longer than gill filaments or 1 1/3 in eye. Scales with 8 to 16 basal radiating striae; apical denticles 68 to 82, basal elements in 2 or 3 transverse series; circuli very fine. Tubes with 1 to 3 branches above and 1 or 2 below. Third dorsal spine 1 1/2 in head; second branched dorsal ray 2 1/2; anal spine 3; first branched anal ray 2 1/4; caudal 1 1/4, widely forked; pectoral 1 1/3; ventral 1 1/5.

Pale brownish generally, yellowish-white on sides and below. Pale blotch over 4 or 5 scales below soft dorsal, followed by small blackish spot close behind soft dorsal. Edge of back deep olive or dusky-brown, then parallel line or same tint from side of snout to eye and posteriorly to pale blotch below soft dorsal. Still parallel and below another dark band from above pectoral base. Fins largely pale, spinous dorsal largely dusky, especially terminally. Soft dorsal with dusky subbasally and 3 dark longitudinal streaks. Anal whitish, with 3 grayish longitudinal streaks. Caudal uniform. Pectoral pale, base dusky. Ventral dusky terminally, base slightly pale. Iris whitish. Length 80 mm.

In the Agassiz Museum 2 from Vavau, Tonga, obtained by the Albatross, larger 88 mm.

East Indies, Melanesia, Polynesia.

Upeneus taeniatus Kner.

Upeneus taeniatus Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, p. 305, 1868 (type loc., Kanathia, Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Kandavu).—Schmeltz: op. cit., Cat. 5, p. 23, 1874 (Viti Islands).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).

Upeneus barberinoides (non Bleeker) Kner: Reise "Novara," Fische, vol. 1, p. 70, pl. 3, fig. 4, 1865 (type loc., Hongkong, China).

Parupeneus kneri Bleeker: Ned. Tijds. Dierk., vol. 4, p. 142, 1874 (on Kner 1865).

Pseudupeneus chrysonemus Jordan and Evermann: U.

S. Fish Comm., Bull., vol. 22, p. 186, 1902 (1903) (type loc., Hilo; Honolulu).—Jenkins: op. cit., vol. 22, p. 454, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 258, pl. 21, 1903 (1905) (Honolulu; Hilo).

Upeneus chrysonemus Jordan and Jordan: Carnegie Mus., Mem., vol. 1, p. 52, Dec. 1922 (Hawaii).

In the National Museum the type of *Pseudupeneus chrysonemus* from Hilo and 2 other Hawaiian specimens. One Hawaiian specimen in the Academy.

Apparently closely related to *Upeneus barberinoides,* but differs in the 2 dark longtitudinal bands along back complete and extending to caudal, without pale blotch below soft dorsal. Originally *Pseudupeneus chrysonemus* was said to be "known by the series of dusky blotches along each side of the dorsal fin and the simple structure of the lateral line." Now the species was founded on 30 specimens, 100 to 215 mm. long. In life young 76 mm. long had "three dark shades under first dorsal, second dorsal and back of caudal peduncle," while in alcohol the color for the species is given as "each scale below dorsal with brownish edgings, generally most distinct in young and often entirely disappearing with age." The barbels are said to reach nearly to the bases of the ventrals through in my specimen are apparently shorter. The statement that "in life it is at once known by its golden barbels" would hardly hold as Bleeker has figured a number of species, in color, with yellow barbels. The above notes are framed from a paratype of *Pseudupeneus chrysonemus,* from Hilo, in the Bishop Museum.

China, Polynesia, Hawaii.

Upeneus macronemus (Lacépède).

Mullus macronemus Lacépède: Hist. nat. Poiss., vol. 3, p. 400, pl. 13, fig. 2, 1802 (no type locality).

Upeneus macronemus Vaillant: Soc. Philom. Paris., Bull., 7th ser., vol. p. 59, 1886-87 (Tahiti).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).

Known by the dark lateral band from the snout through the eye and along lateral line till below soft dorsal and followed on middle of side of caudal peduncle by dark blotch.

One in the National Museum from New Guinea, 273 mm. One in the Academy from the Hawaiian islands.

Red Sea, Zanzibar, East Indies, Polynesia, Hawaii.

Upeneus barberinus (Lacépède).

Mullus barberinus Lacépède: Hist. nat. Poiss., vol. 3, pp. 283, 284, 406, pl. 13, fig. 3, 1802 (type loc., near Moluccas).

Upeneus barberinus Thiollière: Fauna Woodlark, p. 153, 1857 (Woodlark Island).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Kandavu).—Günther: Cruise of "Curacoa," p. 409, 1873 (Solomons).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 57, pl. 4, 1874 (Pelew Islands, Paumotus, Society Islands, Hervey Islands, Kingsmills, Solomons, Upolu).—Günther: Rept. voyage "Challenger," vol. 1, p. 56, 1880 (Nares Harbor, Admiralty Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 245, 1882 (New Guinea).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 16, 1885 (Rubi, New Guinea).—Weber: Zool. Forsch. Australien (Semon), vol. 5, p. (104) 264, 1895 (coast of New Guinea).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 384, 1923 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 10, 1925 (Guam).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 16, 1925 (Johnston Island).—Fowler: op. cit., Bull. 38, p. 17, 1927 (Christmas Island).

Parupeneus barberinus Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1388, 1906 (Upolu).

Pseudupeneus barberinus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 49, 1906 (Tahiti; Shortland Island).—Jordan and Seale: (U. S.) Bur. Fish., vol. 25, p. 276, 1905 (1906) (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 293, 1911 (Vavau, Tonga; Fakarava, Paumotus; Moen and Truk, Carolines).

Upeneus moiavan (Montrouzier) Thiollière: Fauna Woodlark, p. 153, 1857 (name in synonymy).

Head 2 3/4; depth 3 1/3; D. VIII-I, 8, 1; A. I, 6, 1; scales 27 in lateral line to caudal base and 3 more on latter; 3 above, 6 below, 11 predorsal; snout 1 3/5 in head; eye 6 3/4; maxillary 3 1/3; interorbital 2 3/5. Least depth of caudal peduncle 1 7/8 in its length or 2 1/3 in head. Head width 2 1/2 in its length. Snout very long; eye 4 3/4 in snout, 1 3/4 in interorbital. Barbels asymmetrical, left one reaches far as opposite hind eye edge, right one 3/4 of left one. Second dorsal spine 1 1/10 in head, second and third spines with flexible tips, first ray 2 7/8; second anal ray 3; caudal 1 1/4; pectoral 1 3/5; ventral 1 1/2. Length 365 mm.

One from Johnston Island obtained by the *Tanager* in 1923. Also 3 from Guam, 2 Tahiti, 2 Shortland Island, 1 Honolulu. Length 370 mm., of largest. In the Agassiz Museum 1 from Truk, 1 Vavau, 1 from Ascension Island in the Marshall Islands, April 16, 1877, from Rev. Benjamin W. Strong, 2 from the Society Islands and 5 from Kingsmill Islands, both from Andrew Garrett. Not previously reported from Hawaii. The Honolulu and Shortland Island specimens in the Bishop Museum only differ in the dark preocular band, incomplete towards the snout tip, or in most specimens obsolete anteriorly. In this respect they greatly resemble Bleeker's figure of *Parupeneus barberinus* (Atlas ichth., vol. 9, pl. [3] 393, fig. 1, 1877). The two Tahiti specimens have the head marked as in Day's *Upeneus macronemus* (Fishes of India, pt. 1, pl. 31, fig. 1, 1875). In the National Museum 1 without locality, likely from Fiji, and 1 from Singapore or Polynesia, obtained by the Wilkes Expedition. Others through the Bureau of Fisheries are 1 from Apia, 7 Moen, 5 Truk, 3 Vavau, and 1 Fakarava.

Red Sea, Zanzibar, India, East Indies, Queensland, Melanesia, Micronesia, Polynesia, Hawaii.

Upeneus indicus (Shaw).

Mullus indicus Shaw: Gen. zool., vol. 4, p. 611, 1803 (type loc., Indian Seas, on *Rahtee goolivinda* Russell:

Fishes of Coromandel, vol. 2, p. 42, pl. 157, 1803, type loc., Vizagapatam).

Parupeneus indicus Bleeker: Akad. Wiss. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).

Upeneus indicus Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 57, 1874 (Upolu).—Günther: Rept. voyage "Challenger," vol. 1, p. 35, 1880 (Kandavu, Fiji).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 526, 1900 (Samoa).—Fowler: B. P. Bishop Mus., Bull. 22, p. 33, 1925 (Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 16, 1925 (Wake Island).

Pseudupeneus indicus Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1386, 1906 (Upolu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 276, 1905 (1906) (Apia).

Upeneus waigiensis Cuvier: Hist. nat. Poiss., vol. 3, p. 343, 1829 (type loc., Waigiu).

Upeneus griseofrenatus Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, pp. 27, 305, pl. 3, fig. 7, 1868 (type loc., Kandavu, Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Kandavu).

Upeneus malabaricus Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Kandavu).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 58, pl. 45, fig. B, 1874 (Savaii; Tonga).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 23, 1874 (Viti; Savaii; Tongatabu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 245, 1882 (New Guinea).

Head 3 1/3; depth 2 7/8; D. VIII-I, 8, 1; A. II, 6, 1; scales 27 in lateral line to caudal base and 3 more on latter; 2 above, 6 below, 13 predorsal; snout 1 3/4 in head; eye 5 1/5; maxillary 2 1/2; interorbital 3 2/5.

Body strongly compressed, deepest at spinous dorsal origin. Caudal peduncle compressed, least depth 1 2/3 in its length or 2 1/4 in head. Head width 3 1/8 in its length. Snout compressed, upper profile little concave forward, 1 2/3 in snout. Eye high, with front edge midway in head length; 3 in snout, 1 2/3 in interorbital. Mouth moderate, jaws about even. Maxillary reaches 4/5 to eye; expansion 2 3/4 in snout. Lips broad and fleshy, smooth. Barbels reach back but slightly beyond hind eye edge, 1 3/5 in head. Teeth rather large, simple, conic, uniserial in jaws, none on palate or tongue. Front nostril simple pore slightly behind middle in snout length; hind nostril short vertical slit close on front eye edge. Interorbital evenly convex. Gill rakers 9 + 26, III, lanceolate, slightly less than gill filaments, which 1 2/3 in eye.

Scales with 5 basal radiating striae and 1 to 3 incomplete auxiliaries, edge scalloped; apical denticles 182 to 209, basal elements in 5 to 7 transverse series; circuli very fine. Cheek with 4 rows of scales. Lateral line nearly concurrent with profile of back, midway along side of caudal peduncle; tubes well branched or arborescent. Dorsal spines flexible terminally, third 1 1/4 in head, first ray 2 2/5; second anal spine 3 1/2, second ray 2 1/4; caudal 1 1/8, deeply forked; pectoral 1 1/4; ventral 1 1/6.

Back dull olive, sides and lower surface pale brownish. Slight dark shading below hind edge of soft dorsal on caudal peduncle above. Iris pale yellowish. Barbels pale, soiled with dark brown. Spinous dorsal with membrane neutral-gray. Soft dorsal neutral-gray, with 4 whitish lines on outer half longitudinally and others more inclined and at angle on basal half. Anal similar, only white lines broader. Caudal dirty brown with fine paler mottling. Pectoral dull yellowish-brown, base brown and small brown spot at axil above. Ventral dusky-brown on outer half, pale yellowish on inner half. Length 273 mm.

One from Wake Island in the Bishop Museum. No trace of large oval, golden blotch on lateral line opposite interdorsal space. In the National Museum, 1 from New Guinea and 2 from Apia. The Agassiz Museum contains 4 from the Society Islands collected by Andrew Garrett, largest 317 mm. Two in the Academy from Samoa.

Aden, Zanzibar, India, China, Japan, East Indies, Polynesia.

Upeneus pleurostigma Bennett (Pl. XX, *C*).

Upeneus pleurostigma Bennett: Zool. Soc. London, Proc., vol. 1, p. 59, 1831 (type loc., Mauritius).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 58, 1874 (Tahiti; Apamana, Gilberts).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 18, 1902 (Hilo).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 52, Dec. 1922 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 26, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 16, 1925 (Laysan and Lisiansky).

Parupeneus pleurostigma Steindachner: Akad. Wiss. Wien, Denks., vol. 70, p. 486, 1901 (Laysan Island).

Pseudupeneus pleurostigma Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 456, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 527, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 260, fig. 108, 1903 (1905) (Honolulu, Hilo).

The National Museum contains 1 from the Wilkes Expedition, obtained at Maui. Others are 3 from Honolulu, received from the Bureau of Fisheries. In the Bishop Museum 9 from Honolulu, largest 325 mm. I examined 1073 specimens in the Honolulu markets in November and December, 1922, and January, 1923. One from Laysan by the Tanager. The Agassiz Museum contains 1 from the Hawaiian islands, obtained by Andrew Garrett. One Hawaiian specimen in the Academy.

This species has a black spot below the interdorsal region closely followed by a pale blotch.

Zanzibar, Mauritius, East Indies, Micronesia, Polynesia, Hawaii.

Upeneus fraterculus Valenciennes.

Upeneus fraterculus Valenciennes: Hist. nat. Poiss., vol. 7, p. 394, 1831 (type loc., Mahé, Seychelles).

Parupeneus dispilurus Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 486, 1901 (Honolulu).

Body marbled with greenish and rosy, each scale with green edge. Two shining longtitudinal bands. Bright spot on tail behind soft dorsal. First dorsal ray, marbled lighter and brown. Second dorsal with 4 and anal with 3 longitudinal series of rosy spots. Length 178 mm. (Playfair)

I found 5 in the Honolulu market November 18, 1922, largest 508 mm.

Red Sea, Zanzibar, Hawaii.

Upeneus luteus Valenciennes.

Upeneus luteus Valenciennes: Hist. nat. Poiss., vol. 7, p. 392, 1831 (type loc., Mauritius).—Thiollière: Fauna Woodlark, p. 152, 1857 (Woodlark Island).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 246, 1882 (New Guinea).

Parupeneus luteus Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

Upeneus arinuag (Montrouzier) Thiollière: Fauna Woodlark, p. 152, 1857 (name in synonymy).

Upeneus pleurospilos Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 520, 1900 (Tahiti).—Fowler: B. P. Bishop Mus., Bull. 22, p. 37, 1925 (Tahiti).

This species seems to be distinguished by the presence of 3 or 4 blue horizontal bands or lines on the head. The soft dorsal, anal, and caudal are also banded, the former two fins longitudinally and the last fin transversely.

One in the Academy from Tahiti as *Upeneus pleurospilos.*

Günther (Cat. fishes Brit. Mus., vol. 1, p. 407, 1858) in copying Bleeker says, "a black spot below the lateral line, corresponding to the posterior part of the spinous dorsal," also "cheeks and snout with bluish stripes." Bleeker's figure of *Parupeneus pleurospilus* (Atlas ichth., vol. 9, pl. [1] 391, fig. 5) shows the black lateral spot close below the lateral line on the fourth and fifth body scales and below the middle of the spinous dorsal and not corresponding to its posterior part.

Red Sea, Zanzibar, Mauritius, East Indies, Melanesia, Polynesia.

Upeneus crassilabris Valenciennes.

Upeneus crassilabris Valenciennes: Hist. nat. Poiss., vol. 7, p. 393, 1831 (type loc., New Guinea).—Smith and Swain: U. S. Nat. Mus., Proc., vol. 5, p. 129, 1882 (Johnston Island).—Fowler: B. P. Bishop Mus., Bull. 38, p. 16, 1927 (Jarvis Island).

Known by its dark barbels, back purplish and tail pale. Dorsals dusky with pale lines. Barbels short, not extending beyond preopercle edge.

One in the National Museum from Johnston Island. One in Bishop Museum from Jarvis Island, 380 mm.

Upeneus jansenii Bleeker.

Upeneus jansenii Bleeker: Soc. Sci. Ind. Neerl., Act. (Manado), vol. 1, p. 44, 1856 (type loc., Manado, Celebes).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 246, 1882 (New Guinea).

Largely uniform red with yellow fins and barbels.

One in the National Museum 198 mm. long labeled Pacific? is likely from the East Indies. Obtained by the Wilkes Expedition.

East Indies.

Upeneus chryserydros (Lacépède).

Mullus chryserydros Lacépède: Hist. nat. Poiss., vol. 3, pp. 384, 406, 408, 1802 (type loc., Mauritius).

Upeneus chryserydros Cuvier: Hist. nat. Poiss., vol. 3, p. 346, 1829 (Hawaii).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 246, 1882 (New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 18, 1902 (Hilo).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 52, Dec. 1922 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 10, 26, 1925 (Guam; Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 15, 1925 (Johnston and Wake islands).

Upeneus chryserythrus Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 60, pl. 45, fig. A, 1874 (Polynesia).

Parupeneus cherserydros Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

Pseudupeneus chryserydros Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 454, 1902 (1903) (Honolulu).—Snyder: op. cit., p. 527, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 255, fig. 106, 1903 (1905) (Honolulu; Hilo).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 51, 1906 (Faté).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 275, 1905 (1906) (Apia).

Mullus cyclostomus Lacépède: Hist. nat. Poiss., vol. 3, pp. 383, 404, pl. 14, fig. 3, 1802 (no type locality).

Upeneus cyclostoma Günther: Cat. fishes Brit. Mus., vol. 1, p. 409, 1859 (Louisiades, 30 fathoms; Redscar Bar on southeast coast of New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Samoa).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 18, 1902 (Hilo).

Parupeneus cyclostomus Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 486, 1901 (Honolulu).

Pseudupeneus cyclostomus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 275, 1905 (1906) (Pago Pago).

Upeneus oxycephalus Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Samoa).—Günther: Cruise of "Curaçoa," p. 409, 1873 (Solomons).

? *Upeneus filamentosus* Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 264, 1883 (type loc., Hood Bay, New Guinea).

Upeneus saffordi Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 71, 1900 (1901) (type loc., Guam).

Pseudupeneus aurantiacus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 48, fig. 14, 1906 (type loc., Tubuai, Austral Islands).

Head 3; depth 3 1/5 to 3 3/5; D. VIII-I, 8 1; A. II, 6, 1; scales 26 or 27 in lateral line to caudal base and 3 more on latter; 3 scales above lateral line, 7 below; 10 or 11 predorsal scales; snout 1 4/5 to 1 5/6 in head; eye 5 1/4 to 6 2/3; maxillary 2 2/5 to 2 2/3; interorbital 3 3/4 to 3 7/8. Least depth of caudal peduncle 2 3/5 to 2 3/4 in head. Head width 2 1/8 to 2 1/4 in its length. Gill rakers 6 or 7+21 to 24, lanceolate, slender, equal gill filaments or 1 1/4 to 1 2/3 in eye. Third dorsal spine 1 3/5 to 1 2/3 in head; first branched dorsal ray 2 1/3 to 2 3/5; first branched anal ray 2 1/10 to 2 2/5; caudal 1 1/4; pectoral 1 1/2; ventral 1 2/5 to 1 1/2. Largely faded dull uniform brown. Pale area on back of tail scarcely contrasted.

In the Bishop Museum the type of *Upeneus saffordi* from Agaña, Guam. Though Seale simply described the barbels as long and reaching to the ventral base, they really reach slightly beyond the origin of the fin, or at least beyond the head. Jordan and Seale next attempt the improbable and place it with *Upeneus cyclostomus* Günther "with short barbels, reaching preopercular margin, and with a pale area on the back of the tail." Had they examined Seale's original description they could hardly have failed to this extent. The Bishop Museum also contains the types of *Pseudupeneus aurantiacus.* There is little doubt but that Seale's color-note shows it a slight variant of the present species. The barbels extend little beyond the hind preopercle edge. Other specimens are 8 from Honolulu and 1 from Faté. One from Johnston Island and 1 from Wake Island by the Tanager Expedition and 2 from Guam in 1923. Largest 337 mm. The National Museum contains 1 from Honolulu, 1 Apia, 1 Bonin Islands from William Stimpson and 1 Tempe in the Marquesas and young from Tahiti, both obtained by W. H. Jones, June 12 to 15, 1883. Also 1 from Samoa as *Pseudupeneus cyclostomus.* One in Academy

from Honolulu. I examined 105 specimens in the Honolulu markets during November and December, 1922.

Possibly *Upeneus filamentosus* may have been based on a specimen of this species, with the following features: Head greater than depth, profile straight; depth 4 in total; D. VIII, 9; A. 7; lateral line scales 28, 2 above, 5 below; snout long, rather pointed; eye 2 in interorbital, 4 in snout; mouth small, lips thick. Spinous dorsal ends in filaments, third spine equals height of body. Color pink, with yellow and blue lines about head and soft dorsal. Length 230 mm.

Upeneus bilineatus Valenciennes (fig. 47).

Upeneus bilineatus Valenciennes: Hist. nat. Poiss., vol. 7, p. 394, 1831 (type loc., Amboina).—Günther: Cat. fishes British Mus., vol. 1, p. 411, 1859 (copied).—Fowler: B. P. Bishop Mus., Bull. 38, p. 17, fig. 2, 1927 (Palmyra Island).

FIGURE 47.—Drawing of *Upeneus bilineatus* Valenciennes.

Readily known by its several pale longitudinal lateral bands.

Known only from the type obtained in the East Indies and the specimen in the Bishop Museum recently obtained at Palmyra Island, 232 mm. long.

Valenciennes notes this species with uniserial conic jaw teeth, palate smooth, snout and barbels short or latter not passing angle of opercle, length 76 mm.

Red Sea, Mauritius, Zanzibar, Mascarene Islands, East Indies, Melanesia, Micronesia, Polynesia, Hawaii.

Mulloides auriflamma (Forskål) (Pl. XXI, *A*).

Mullus auriflamma Forskål: Descriptiones animalium pp. 10, 30, 1775 (type loc., Djedda, Red Sea).

Mulloides auriflamma Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 485, 1901 (Laysan, Honolulu).—Jenkins: (U. S.) U. S. Fish Comm., Bull., vol. 22, p. 454, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 527, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 250, fig. 103, 1903 (1905) (Honolulu; Hilo).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1386, 1906 (Samoa).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 48, 1906 (Nukuhiva; Tahiti; Tubuai).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 276, 1905 (1906) (Pago Pago; Apia).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 123, 1912 (Rikitea, Mangareva).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 26, 1925 (Honolulu).

? Mullus japonicus Houttuyn: Hollandsche Maatsch. Haarlem, Verh., vol. 20, p. 334, 1872 (type loc., Japan).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 15, 1925 (French Frigates Shoal and Johnston Island).

Mulloides japonicus Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Viti Islands).

Mullus flavolineatus Cuvier: Hist. nat. Poiss., vol. 3, p. 336, 1829 (Borabora).

Mulloides flavolineatus Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Savay).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 56, 1874 (South Pacific).—Streets: U. S. Nat. Mus., Bull., no. 7, p. 89, 1877 (Fanning Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 263, 1883 (Hood Bay, New Guinea).—Vaillant: Soc. Philom. Paris, Bull., 7th ser., vol. 11, p. 58, 1886-87 (Tahiti).—Weber: Zool. Forsch. Australien (Semon), vol. 5, p. (104) 264, 1895 (coast of New Guinea).—Waite: Australian Mus., Mem., no. 3, p. 184, 1897 (Funafuti, Ellice Islands).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 294, 1911 (Makemo, Paumotus; Vavau, Tonga; Funafuti, Ellice Islands; Borabora, Society Islands).

Upeneus zeylonicus Cuvier: Hist. nat. Poiss., vol. 3, p. 338, 1829 (type loc., Trinquemale, Ceylon).—Valenciennes: op. cit., vol. 7, p. 391, 1831 (New Guinea).

Upeneus atherinoides Cuvier: Hist. nat. Poiss., vol. 7, p. 395, 1831 (type loc., Guam).

Mulloides samoensis (non Günther) Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 128, 1902 (1903) (Marcus Island).

Mulloides flammeus (non Jordan and Evermann) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 48, 1906 (Tahiti).

Mulloides ruber (non Lacépède) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 48, 1906 (Tahiti).

Head 3 1/8 to 3 3/5; depth 3 2/3; D. VII-I, 8, 1; A. II, 6, 1; scales 38 in lateral line to caudal base and 3 more on latter; 3 scales above lateral line, 8 below; 14 predorsal scales; snout 2 1/8 in head; eye 3 3/4 to 4 2/5; maxillary 3; interorbital 3. Least depth of caudal peduncle 2 2/3 in head. Head width 1 9/10 in its length. Gill rakers 8 or 9+23 or 24, lanceolate, 1 4/5 in gill filaments or 1 1/8 in eye. First dorsal spine 1 9/10 in head; first branched dorsal ray 2 1/8; first

branched anal ray 2 1/8; caudal 1 1/8; pectoral 1 1/2: ventral 1 1/2.

The Bishop Museum contains 4 from Honolulu, 1 Tubuai, 2 Tahiti, 1 Nukuhiva, 1 Faté, 1 Marcus Island. Largest 323 mm. I also examined 1220 specimens in the Honolulu markets in November and December, 1922, and January. 1923. One at Waikiki, October 29, 1922. Five from French Frigates Shoal and 4 from Johnston Island by the Tanager. In the National Museum 4 from Honolulu, 6 Apia, 1 Fanning Islands, 2 Funafuti, 1 Borabora, 1 Rikitea, 4 Makemo, 1 Vavau, 1 Guam, 1 New Guinea, and 2 Bonin Islands received from William Stimpson. The Agassiz Museum has 3 Hawaiian specimens from Andrew Garrett, 6 from Honolulu obtained by W. H. Jones April 7, 1874, 2 from the Society Islands from Andrew Garrett, and 3 Borabora. One Hawaiian specimen in the Academy.

Red Sea, East Indies, Melanesia, Micronesia, Polynesia, Hawaii.

Mulloides erythrinus Klunzinger.

Mulloides erythrinus Klunzinger: Fische Rothen Meeres, vol. 1, p. 50, 1884 (on *Mulloides ruber,* non Lacépède, Klunzinger: Zool. bot. Ges. Wien, Verh., vol. 20, p. 743, 1870, type loc., Red. Sea).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 485, 1901 (Laysan).

Mulloides ruber (non Lacépède) Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 56, pl. 23, fig. A, 1874 (Tahiti).

Distinguished chiefly on account of its larger scales (42 or 43), though allied with *Mulloides auriflamma.*

Red Sea, Polynesia, Hawaii.

Mulloides vanicolensis (Cuvier).

Upeneus vanicolensis Cuvier: Hist. nat. Poiss., vol. 7, p. 391, 1831 (type loc., Vanicolo).—Smith and Swain: U. S. Nat. Mus., Proc., vol. 5, p. 131, 1882 (Johnston Island).

Mulloides vanicolensis Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Samoa; Viti.)—Macleay: Linn. Soc. New South Wales, Proc., vol. 4, p. 62, 1879 (Solomons).

Body without median longtitudinal golden band. Hind caudal edge narrowly brown.

In the National Museum 2 New Guinea, 1 Hilo and 1 Johnston Island.

East Indies, Melanesia, Polynesia, Micronesia.

Mulloides samoensis Günther.

Mulloides samoensis Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 57, pl. 43, fig. B, 1874 (type loc., Apia, Samoa).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 12, 1877 (Ponapé).—Waite: Australian Mus., Mem., no. 3, p. 184, pl. 8, fig. 2a, 1897 (Funafuti, Ellice Islands).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, pt. 3, p. 71, 1900 (1901) (Guam).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 453, 1902 (1903) (Honolulu).—Waite: Australian Mus., Records, vol. 5, p. 3, 1903 (Nauru, Pleasant Island, Marshalls; Paanope, Ocean Island, Gilbert Group).—Snyder: U. S. Fish Comm., Bull., vol. 22, p. 527, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 253, fig. 105, 1903 (1905) (Oahu; Hilo).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 47, 1906 (Faté; Nukuhiva).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1386, 1906 (Upolu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 276, 1905 (1906) (Apia).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 355, 1906 (Tahiti).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 294, 1911 (Funafuti, Ellice Islands; Vavau, Tonga; Makemo, Fakarava and Rangiroa, Paumotus; Guam).—Jordan and Metz: U. S. Nat. Mus., Proc., vol. 42, p. 527, 1912 (Honolulu).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 123, 1912 (Rikitea, Mangareva).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 52, Dec. 1922 (Honolulu).—Nichols: Am. Mus. Novit., no. 94, p. 3, Oct. 19, 1923 (Oeno Island).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 10, 26, 33, 1925 (Guam; Honolulu; Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 15, 1925 (Laysan and Lisiansky).—Fowler: op cit., Bull. 38, p. 16, 1927 (Christmas and Laysan islands).

Upeneus preorbitalis Smith and Swain: U. S. Nat. Mus., Proc., vol. 5, p. 132, 1882 (type loc., Johnston Island).

Mulloides flavolineatus (non Lacépède) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 71, 1900 (1901) (Guam).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 52, Dec. 1922 (Honolulu).

Mulloides pflugeri Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 485, pl. 3, fig. 4, 1901 (type loc., Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 251, 1903 (1905) (Honolulu).—Jordan and Snyder: (U. S.) Bur. Fish., Bull., vol. 26, p. 214, 1906 (1907) (Honolulu).—Jordan and Jordan: Carnegie Mus., vol. 10, no. 1, p. 52, Dec. 1922 (Hawaii).

Mulloides flammeus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 186, 1902 (1903) (type loc., Hilo).—Snyder: op. cit., vol. 22, p. 527, 1902 (1904) (Puako Bay, Hawaii).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 251, fig. 104, 1903 (1905) (Honolulu, Hilo, Kailua).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 48, 1906 (Raiatea).

Pseudupeneus pleurospilus (non Bleeker) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 51, 1906 (Shortland Island).

Head 3 1/8; depth 3 3/4; D. VII-I, 8, 1; A. II, 6, 1; scales 37 in lateral line to caudal base and 2 more on latter; 3 scales above lateral line, 6 below; 15 predorsal scales; snout 2 1/10 in head; eye 4; maxillary 3 1/5; interorbital 3. Least depth of caudal peduncle 3 1/8 in head; head width 2. Gill rakers 7+18, lanceolate, 1/2 of gill filaments or 2 1/2 in eye. Second dorsal spine 1 3/5 in head; first branched dorsal ray 2 1/2; first branched anal ray 2 2/5; caudal 1 1/8; pectoral 1 3/5; ventral 1 3/5.

The Bishop Museum contains 6 from Honolulu, 1 Tahiti, 3 Agaña on Guam, 6 Faté, 1 Raiatea, 12 Nukuhiva, 1 Shortland, and 3 Palmyra from Thurston and Thaanum in 1922. Largest 288 mm. I examined 1015 specimens in the Honolulu markets during November and December 1922 and January 1923. Five from Lisiansky Island and 1 from Laysan by the Tanager and 3 from Guam in 1923. The Agassiz Museum contains 2 Hawaiian specimens, one received from Andrew Garrett, 2 Guam, 2 Vavau, and from Andrew Garrett 2 Society Islands and 2 Apiang in the Gilbert Islands.

In the National Museum the Wilkes Expedition specimens comprise 1 without locality and 1 from Singapore or Polynesia, though both likely from Oceania? Also small specimen 40 mm. long poorly preserved from Maui. Other materials are 1 from the Bonin Islands through William Stimpson, 13 from Tahiti through

W. H. Jones, 1 Apia May 15, 1883 also from Jones, 8 Apia through Bureau of Fisheries, 12 Honolulu, 22 Hilo, 1 Rikitea, 1 Fakarava, 1 Makemo, 4 Funafuti, 1 Rangiroa, and the type of *Upeneus preorbitalis* from Johnston Island.

Mulloides flammeus is certaintly close to *Mulloides samoensis*. The distinctions advanced by Jordan and Evermann will not hold with my materials. The gill rakers are given as 7+18, therefore of fundamental value, though in exact agreement with my series of *Mulloides samoensis*. If *Mulloides pflugeri* is the same as *Mulloides flammeus*, as suggested by Jordan and Snyder, it resolves as a synonym. Both the size of the eye and the presence of the black lateral spot are variable characters in *Mulloides samoensis*.

Melanesia, Micronesia, Polynesia, Hawaii.

SCIAENIDAE

The species *Sciaena fimbriata* (Forster) Lichtenstein is known only from the original fragmentary account (Descriptiones animalium, p. 189, 1844, type loc., Tongatabu) and doubtless is not a member of the Sciaenidae.

Body oblong, lanceolate, scaly. D. rays 22; A. 14; C. 20; P. 22; V. 5. Dorsal and ventral rays simple, flexible, not spiny. Silvery, with black blotch below pectoral fins. Caudal bifurcate, black medially, edged red.

Another nominal form I am unable to place is *Sciaena mugil* (Forster) Schneider (Systema ichth., Bloch, p. 541, 1801, type loc., Tahiti; Lichtenstein, Descriptiones animalium, p. 187, 1844, type). Its characters are:

Body ovate, elongate. Head subobtuse, scaly. Snout short, obtuse. Eye superior. Mouth moderate, oblique, lower jaw longer. Teeth in jaws and on palatines, minute and pointed; tongue smooth. Dorsal with 9 strong spines and 11 branched rays. Anal with 11 branched rays. Caudal bifurcate. Silvery. Back and head above bluish-gray. Iris yellowish-silvery. Caudal black, with 2 oblique blotches and tip white.

Jouan describes an unidentifiable *"Sciana"* from Port de France, New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 271, 1861):

Body elongate, somewhat cylindrical. Head compressed. Snout pointed. Eyes very large. Lower jaw included. Teeth small, sharp. Very strong spine on opercle behind. Dorsals appear united, spines 5 with fourth longest. Caudal rounded. Pectoral pointed Vent before middle in body. Length 120 mm.

Johnius belangeri (Valenciennes).

Corvina belangeri Valenciennes: Voyage Ind. Orient. Bélanger, p. 357, 1834 (type loc., East Indies).

Sciaena belengeri Weber: Nova Guinea, vol. 9, pt. 3, p. 588, 1913 (Lorentz River, Varen River and Sermowai River).

Sciaena belangeri Regan: Zool. Soc. London, Trans., vol. 20, pt. 6, p. 276, 1914 (Mimika River, New Guinea).

D. IX, I, 27 to 32; A. II, 7; scales 52 in lateral line, 6 above, 14 below; eyes 3 1/2 to 3 3/4 in head; no enlarged inner row of lower teeth; second anal spine 2 1/4 in head. Slate-colored, vertical fins nearly black. (Day)

India, East Indies.

Johnius goldmanni (Bleeker).

Corvina goldmanni Bleeker: Nat. Tijds. Ned. Ind., vol. 7, p. 371, 1854 (type loc., Soengi Puan).

Johnius goldmani Bleeker: Soc. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).

D. IX, I, 31; A. II, 7; scales 47 in lateral line; eye 4 2/3 in head; second anal spine 2 1/2 in head. Above greenish, with darker blotch above opercle; spinous dorsal edged brown. (Günther)

East Indies.

Johnius papuensis (Hase).

Corvina papuensis Hase: Jena. Zeitsch. Nat., vol. 51, p. 531, figs. 4-6, 1914 (type loc., Tami, Kaiser-Wilhelms-Land, New Guinea).

Head 3; depth 3; D. IX, I, 28; A. II, 8; scales 45 to 48 in lateral line, 4 or 5 above, 9 or 10 below; snout 4 in head; eye 4 4/5; maxillary 2 1/4; second anal spine 2 7/8. Largely silvery, back brownish, yellow, below white. First dorsal black, spines glazed silvery. Inner side of pectoral dark brown, dark blotch in axil. Length 193 mm. (Hase)

SILLAGINIDAE

Sillago sihama (Forskål).

Atherina sihama Forskål: Descriptiones animalium, pp. xiii, 70, 1775 (type loc., Lohaja, Red Sea).

Sillago sihama Peters: Akad Wiss. Berlin, Monatsb., p. 836, 1876 (1877) (Bougainville, Solomons).—Günther: Rept. voyage "Challenger," vol. 1, p. 56, 1880 (Nares Harbor, Admiralty Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 360, 1882 (New Guinea).

Sillago malabarica Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 2, 1859 (Doreh, New Guinea).

Sillago gracilis Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 279, pl. 6, fig. 2, 1876 (type loc., Darnley Island or Hall Sound, New Guinea).

D. XI-I, 22 or 23; A. I, 22 or 23; scales 70 in lateral line, 4 above, 11 below; interorbital 2 in snout. Uniform brownish-yellow, with silvery lateral streak; fins transparent reddish-violet. Length 330 mm. (Günther)

Sillago gracilis is based on 2 specimens 76 mm. long with 3 rows of alternating dark blotches on side of body. It is doubtless the young.

Red Sea, Madagascar, India, East Indies, Queensland, China, Melanesia.

Sillago macrolepis

Sillago macrolepis Bleeker: Nat. Tijds. Ned. Ind., vol. 17, p. 166, 1858-59 (type loc., Batavia; Boleling, Bali).

Head 4 to 4 2/5 in total; depth 6 to 6 1/3; D. XI, I, 19 or 20; A. II, 19; scales 50 to 55, above 4; eye 2 1/2 in head, 2 in interorbital. Ventral spine feeble. Coloration uniform. (Günther)

East Indies.

Sillago ciliata Cuvier.

Sillago ciliata Cuvier: Hist. nat. Poiss., vol. 3, p. 306, 1829 (type loc., Port King George).—Castelnau: Zool. Acclimat. Soc. Victoria, Proc., vol. 2, p. 113, 1873 (Noumea, New Caledonia).

Sillago diadoi Thiollière: Fauna Woodlark, p. 151, 1857 (type loc., Woodlark Island).

Sillago insularis Castelnau: Zool. Acclimat. Soc. Victoria, Proc., vol. 2, p. 113, 1873 (type loc., Noumea, New Caledonia).

D. XI-I, 17 or 18; A. II, 15 or 16; scales 63 in lateral line, 5 above, 12 below; interorbital 2 1/4 in snout. Silvery, with yellowish longitudinal streak; first dorsal marbled blackish, second with 4 or 5 series of oblong dots. (Günther)

The description of *Sillago* by Jouan (Soc. Cherbourg, Mem., vol. 8, p. 272, 1861, Kanala, Dum'bea Bay, New Caledonia) also refers to this species.

Australia, Melanesia.

MALACANTHIDAE

Malacanthus hoedtii Bleeker (Pl. XXI, *B*).

Malacanthus hoedtii Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. (3) 18, 1859 (type loc., Doreh, New Guinea).—Günther: Cat. fishes Brit. Mus., vol. 3, p. 361, 1861 (Louisiades).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 160, pl. 98, fig. B, 1876 (Tahiti; Yap; Hawaii; Louisiades).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 497, 1901 (Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 15, 1902 (Hilo).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 26, 1925 (Honolulu).

Malacanthus hoedti Bleeker: Nat. Tijds. Ned. Ind., vol. 20, p. 93, 1859-60 (New Guinea).

Malacanthus parvipinnis Vaillant and Sauvage: Rev. Mag. Zool., 3rd ser., vol. 3, p. 283, 1875 (type loc., Hawaiian islands).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 497, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 536, 1902 (1904) (Honolulu; Lahaina).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 275, fig. 118, 1903 (1905) (Honolulu; Hilo).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 53, Dec. 1922 (Honolulu).

Head 4 1/2 to 4 2/3; depth 6 1/2 to 6 3/4; D. 59 or 60; A. 49 to 53; scales 137 to 148 in lateral line to caudal base and 4 more on latter; 7 or 8 scales above lateral line, 28 below; 18 to 25 predorsal scales; snout 3 in head; eye 4 3/4 to 5 2/3; maxillary 2 3/4 to 2 5/6; interorbital 3 to 3 1/8.

The Academy has 5 Hawaiian specimens, 183 to 277 mm. In the National Museum 1 from Maui, obtained by the Wilkes Expedition, 280 mm. Also 4 Hawaiian specimens through the Bureau of Fisheries. The Bishop Museum has 3 from Honolulu and 1 from Hilo. I found 5 in the Honolulu markets in December 1922. The Agassiz Museum has a Hawaiian specimen obtained by Andrew Garrett.

Mauritius, East Indies, Melanesia, Micronesia, Polynesia, Hawaii.

Malacanthus latovittatus (Lacépède).

Labrus latovittatus Lacépède: Hist. nat. Poiss., 3, pp. 455, 526, pl. 28, fig. 2, 1802 (type loc., Great Equatorial Ocean [Indo-Pacific]).—Quoy and Gaimard: Voyage "Astrolabe," Zool., vol. 3, p. 701, pl. 20, fig. 3, 1834 (Port Dorey, New Guinea).

Malacanthus latovittatus Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 5, 1859 (Doreh, New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 160, 1876 (Pelew Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 360, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 266, 1883 (Goldie River, New Guinea).

Malacanthus latevittatus Schmeltz: Mus. Godeffroy, Cat. 6, p. 15, 1877 (Pelew Islands).

Oceanops latovittata Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 277, pl. 39, 1905 (1906) (Pago Pago).

Malacanthus taeniatus Valenciennes: Hist. nat. Poiss., vol. 13, p. 239, pl. 381, 1839 (Doreh Harbor, New Guinea).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).

D. 50; A. 41; scales 125 in lateral line. A broad, black, lateral band. (Günther)

Malacanthus urichthys Fowler (Acad. Nat. Sci. Philadelphia, Jour., ser. 2, vol. 12, p. 549, pl. 16, lower fig., 1904) from Padang, Sumatra, is a synonym of the present species.

Mauritius, East Indies, Micronesia, Polynesia.

LABRACOGLOSSIDAE

Platystethus cultratus (Schneider).

Cichla cultrata Schneider: Systema ichth., Bloch, p. 343, 1801 (type loc., Norfolk Island).

Platystethus cultratus Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 97, pl. 2, fig. 3, 1912 (Cook Bay, Easter Island).

Bathystethus orientale Regan: Zool. Soc. London, Proc., p. 373, 1913 (type loc., Easter Island).

Head 4; D. VIII, I, 27; A. III, 32; eye 3 1/2 in head or nearly equal to its distance from edge of lower limb of preopercle. Length 200 mm. (Regan)

One in the National Museum from Cook Bay, Easter Island.

CIRRHITIDAE

Cheilodactylus vittatus Garrett (Pl. XXI, *C*).

Cheilodactylus vittatus Garrett: Cal. Acad. Sci., Proc., vol. 3, p. 103, 1864 (type loc., Hawaiian islands).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 489, 1902 (1903) (Honolulu).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 28, p. 125, 1904 (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 447, pl. 54, 1903 (1905) (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 26, 1925 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 38, p. 18, 1927 (Honolulu).

Chilodactylus vittatus Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 73, pl. 51, fig. B, 1874 (Hawaiian islands).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 490, 1901 (Honolulu).

Goniistius vittatus Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 611, 1908 (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 53, Dec. 1922 (Honolulu).

Head 3 1/6; depth 2 2/5; D. XVII, 30, 1; A. III, 8, 1; scales 59 in lateral line to caudal base and 6 more on latter; 10 scales above lateral line, 17 below, 31 predorsal; head width 1 5/6 in its length; least depth of caudal peduncle 3 4/5; fourth dorsal spine 1 1/3; first branched dorsal ray 3 7/8; third anal spine 4; second branched anal ray 1 2/3; caudal 1 1/8; pectoral 1; ventral 1 3/5. Length 148 to 355 mm.

Eight specimens in the Bishop Museum, obtained in the Honolulu markets. Jordan and Evermann say the species is extremely rare, though the above shows it to be more frequent than supposed, besides of greater size. The color-pattern is quite constant, though the young differs in the dorsal black band embracing most of the caudal peduncle and continued over the entire lower caudal lobe.

Cirrhitoidea bimacula Jenkins.

Cirrhitoidea bimacula Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 488, fig. 36, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 448, fig. 197, 1903 (1905) (types).—Fowler: B. P. Bishop Mus., Bull. 22, p. 27, 1925 (Honolulu).

Head 2 1/2 to 2 2/3; depth 2 3/5 to 3; D. X, 12; A. III, 6 or 7; tubes 39 to 41 in lateral line to caudal base and 1 to 4 more on latter; 3 scales above lateral line, 8 or 9 below, 22 or 23 predorsal; snout 3 1/6 to

3 1/5 in head; eye 4 to 4 1/5; maxillary 2 5/6 to 3; interorbital 6 to 6 1/5

Body compressed, elongate ovoid. Caudal peduncle well compressed, long as deep, least depth 3 to 3 2/5 in head. Head width 1 4/5 to 2 in its length. Snout conic, width 1 1/5 its length. Eye large, hind edge midway in head length; diameter 1 1/4 in snout, greater than interorbital. Mouth moderate, lower jaw slightly shorter. Maxillary reaches eye; expansion 2 1/4 in eye. Lips broad, smooth. Bands of fine, simple, conic teeth in each jaw, anterior much broader; small patch of fine teeth on vomer; palatines and tongue toothless. Nostrils rather close together; front one at last fourth in snout, with fringed flap about half of eye; hind one simple pore midway between front one and eye. Interorbital concave. Gill rakers 4+10, lanceolate, 1 1/5 in gill filaments, which half of eye.

Scales with 7 or 8 basal radiating striae; circuli fine. Cheek with 6 rows of scales. Lateral line concurrent with dorsal profile, slopes midway to caudal base; tubes small, simple, oblique, mostly concealed. Fifth dorsal spine 2 3/4 to 3 in head, first ray 2 1/10 to 2 1/2; second anal spine 2 1/4 to 2 1/3, first ray 2 1/10; caudal 1 2/5 to 1 3/4, rounded convexly behind; pectoral 1 to 1 1/6; ventral 1 3/4 to 1 7/8.

Dull brown generally. About 7 darker broad transverse bands, sloping down from back and narrowing below. In each pale interspace similar duller oblique band. On opercle and back at middle of soft dorsal base round deep brown ocellus little smaller than eye. Fins all brownish. Length 55 to 61 mm.

In the Bishop Museum, 2 specimens, 1 obtained by J. W. Thompson at Honolulu and the other from C. H. Edmondson, taken at Waikiki in December 1922. A third specimen is without locality, though doubtless from Honolulu. In the National Museum the type of *Cirrhitoidea bimacula*.

Cirrhitoidea appears to differ from the other genera in its pointed snout.

Cirrhitus pinnulatus (Schneider) (Pl. XXII, *A*)

Labrus pinnulatus (Forster) Schneider: Systema ichth., Bloch, p. 264, 1801 (type loc., Tahiti).—Lichtenstein: Descriptiones animalium, p. 186, 1844 (Tahiti).

Labrus marmoratus Lacépède: Hist. nat. Poiss., vol. 3, pp. 438, 493, pl. 5, fig. 3, 1802 (type loc., Great Equatorial Ocean).

Cirrhitus marmoratus Gill: Acad. Nat. Sci. Philadelphia, Proc., p. 107, 1862 (Hawaiian islands).—Snyder: U. S. Fish Comm., Bull., vol. 22, p. 527, 1902 (1904) (Honolulu; Puako Bay, Hawaii).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 452, pl. 70, 1903 (1905) (Honolulu, Kailua, Hilo).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 278, 1905 (1906) (Apia).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 11, 27, 1925 (Guam; Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 16, 1925 (Laysan, Nihoa, Necker, Johnston islands).—Fowler: op. cit., Bull. 38, p. 18, 1927 (Washington, Fanning, Baker, and Kahoolawe islands).

Cirrhites marmoratus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 17, 1902 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 491, 1902 (1903) (Honolulu).—Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 131, 1902 (1903) (Marcus Island).

Cirrhitus marmosatus Fowler: Copeia, 112, p. 83, Nov. 20, 1922 (Hawaii).

Cirrhitus maculatus Lacépède: Hist. nat. Poiss., vol. 5, pp. 2, 3, 1803 (no type locality) (on Commerson).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 16, 1925 (Johnston and Wake islands).

Cirrhitichthys maculatus Günther: Cat. fishes Brit. Mus., vol. 2, p. 74, 1860 (Polynesia and Hawaiian islands).—Günther: Rept. voyage "Challenger," vol. 1, p. 59, 1880 (Honolulu).

Cirrhites maculatus Günther: Mus. Godeffroy, Jour., vols, 2-3, pts. 5-6, p. 71, pl. 51, fig. A, 1874 (Hawaiian, Society, and Cook islands).—Waite: Australian Mus., Mem., no. 3, p. 186, 1897 (Funafuti, Ellice Islands).—Waite: Australian Mus., Records, vol. 5, p. 3, 1903 (Nauru, Pleasant Island, Marshall Islands).

Cirrhites (*Cirrhitichthys*) *maculatus* Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 490, 1901 (Honolulu and Laysan).

Cirrhites maculosus Bennett: Zool. Journ., vol. 4, p. 38, 1828 (type loc., Hawaiian islands).

Cirrhites punctatus Cuvier: Hist nat. Poiss., vol. 3, p. 52, 1829 (no type locality).—Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, p. 308, 1868 (Savay, Samoa).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Savay).

Cirrhitus alternatus Gill: Acad. Nat. Sci. Philadelphia, Proc., vol. 14, pp. 106, 107, 1862 (type loc., Hawaiian islands).

Head 2 1/2 to 2 3/4; depth 2 4/5 to 3; D. X, 11, 1; A. III, 4, 1 to 6, 1; scales 37 to 40 in lateral line to caudal base and 2 or 3 more on latter; 4 or 5 scales above lateral line, 10 below, 13 to 18 predorsal; snout 2 7/8 to 3 in head; eye 3 3/4 to 5 7/8; maxillary 2 1/6 to 2 2/5; interorbital 6 to 6 1/8. Least depth of caudal peduncle 3/4 to 1 in its length, 2 1/2 to 3 2/3 in head. Head width 1 1/2 to 2 in its length. Snout conic, width 1 1/6 to 1 2/5 in its length. Maxillary reaches opposite hind eye edge; expansion 2 in eye. Interorbital deeply concave. Gill rakers 4+13, low, asperous tubercles; greatly lower than gill filaments, which 2 1/6 in eye. Fourth dorsal spine 2 3/5 to 3 in head, second ray 2; second anal spine 2 1/4 to 2 7/8, second ray 1 4/5 to 2 1/6; caudal 1 3/5 to 1 4/5, rounded behind; pectoral 1 1/3 to 1 3/5; ventral 1 3/4 to 1 7/8.

Brown above, paler below. Back and sides finely spotted with dusky to blackish, as streaks across cheek and as much finer blackish spots on caudal, coarser on dorsals, few on anal. Few dull brown spots on pectoral. Iris brownish.

Young brown generally, paler below. Pattern leaving about 3 alternated rather large whitish blotches, about 6 in each series; intervening brown area obscurely blotched with dusky. Head with large brown blotches, 2 across chin and 1 behind maxillary. Vertical fins pale, spotted with deep brown. Paired fins pale brown, with brown spot at pectoral base and 2 more at gill opening.

One in the Bishop Museum from Marcus Island, length 215 mm. Three from Johnston Island and 2 from Wake Island, in 1923, 97 to 238 mm. Also 1 from Nihoa, 1 Necker, 1 Laysan, and 2 from Guam in 1923, 1 from Rarotonga in Cook Islands through Seale in 1901, 4 from Honolulu. I examined 96 in the Honolulu markets during November and December 1922. The National Museum has 3 adults from Samoa through the Bureau of Fisheries, which certainly agree with Günther's figure. Besides these 1 from Honolulu, obtained by W. H. Pease and 5 Hawaiian specimens from the Bureau of Fisheries. The Wilkes Expedition collected 2 at Oahu, 1 from Maui and 1 without locality. In the Agassiz Museum 4 Hawaiian specimens, also 12 from Andrew Garrett in 1860 and 5 from W. H. Jones April 27, 1874, 2 from Maui, and 8 from Kauai through Andrew Garrett. Two from

the Society Islands through Andrew Garrett and 2 from the Kingsmill Islands. One obtained by Andrew Garrett and 3 by Rev. B. G. Snow in 1877 at Ebon Island, Marshall Islands. One from Ascension Island, in the Marshall Islands, by Rev. A. A. Strong April 14, 1877. The Academy has 12 Hawaiian specimens, mostly from Honolulu, 114 to 213 mm.

Distinguished from the other members of the genus by the small scales crowded on the cheeks. The original account of *Cirrhites punctatus* is very brief. It is described with extensive brown marbling with black spots. Kner's note states the body to be covered with dark brown blotches, except on the ventral fins and the body also with more or less clear crossbands. Possibly Günther's identification of an adult stuffed specimen (Cat. fishes Brit. Mus., vol. 2, p. 72, 1860) without locality and said to have the pectoral reaching to the origin of the anal, may not be Cuvier's species. No specimen of any species I have seen has so long a pectoral. *Labrus pinnulatus* seems to be the oldest name available for this species. It is described somewhat as follows:

D. IX, I, 11; A. III, 6; P. 6+6. Body ovate-oblong, scaled. Head declivous, broad. Snout blunt. Eyes high, near snout. Mouth moderate, oblique. Lips fleshy, double. Jaws subequal, toothed. Teeth small, conic; 2 canines in each jaw; palate teeth. Nostrils together, posterior larger. Bifid tentacle before eyes between front nostrils. Livid, sparsely marked with purple spots. Iris reddish. Vertical fins spotted with purple. Paired fins reddish.

Red Sea, East Africa, East Indies, Micronesia, Polynesia, Hawaii.

Cirrhitus oxycephalus Bleeker.

Cirrhites oxycephalus Bleeker: Nat. Tijds. Ned. Ind., vol. 8, p. 408, 1855 (type loc., Amboina).—Günther: Journ. Mus., Godeffroy, vols. 2-3; pts. 5-6, p. 71, 1874 (Bonham Islands, Marshalls).

Cirrhitichthys oxycephalus Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).

Head 4 in total; depth 4 2/3; D. X, 12 or 13; A. III, 6 or 7; scales 40; snout little shorter than eye; preorbital without denticulations. Fourth and fifth dorsal spines longest, 1 1/3 to 1 1/2 in body depth; first dorsal ray produced in filament; second anal spine strong, longer than longest dorsal spine; pectoral with 6 simple rays, longest reaching anal. Rose-colored; body with 5 oblique crossbands and spots between bands; head with 2 transverse bands. Length 75 mm. (Bleeker)

Reunion, East Indies.

Cirrhitus oxyrhynchos (Bleeker).

Cirrhitichthys oxyrhynchos Bleeker: Nat. Tijds. Ned. Ind., vol. 15, p. 205, 1858 (type loc., Goram Island).

Cirrhitichthys oxyrhynchus Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Viti Islands).—Schmeltz: op cit., vol. 6, p. 13, 1877 (Pelew Islands).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 372, 1897 (Rotuma Island).

Possibly the young of *Cirrhitus afrinus* Cuvier. According to Bleeker *Cirrhitus oxyrhynchos* is based on small slender specimens with but 5 simple lower pectoral rays. Length 51 mm.

Paracirrhites hemistictus (Günther).

Cirrhites hemistictus Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 69, pl. 50, fig. B, 1874 (type loc., Kingsmill and Society islands).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 13, 1877 (Raiatea).

Head 2 3/4; depth 2 7/8; D. X, 11, 1; A. III, 6, 1; scales 45 in lateral line to caudal base and 5 more on latter; 6 scales above lateral line to spinous dorsal origin, 12 below, 12 predorsal; snout 3 in head; eye 6 3/5; maxillary 2 1/2; interorbital 6 1/5.

Body rather slender, elongately ovoid, compressed. Caudal peduncle well compressed, least depth about equals its length or 2 1/2 in head. Head width 2 in its length. Snout convex, profile with slight depression before nostrils, width about 1 1/3 in its length. Eye elevated, front pupil edge about first third in head; diameter 2 1/4 in snout, 1 1/5 in interorbital. Mouth large, jaws strong, even. Maxillary reaches about opposite front pupil edge; expansion 1 1/4 in eye. Teeth villi form, in bands in jaws, outer enlarged series of conic ones, pair of upper canines and pair of antero-lateral canines subequally large. Vomer with patch of small, fine teeth, none on palatines. Front nostril near last fourth in snout, with short fringed flap and little smaller than hind nostril, which superiorly close behind. Interorbital slightly concave. Hind preopercle edge feebly dentate, serrae above obtuse angle. Preorbital with few striae. Suprascapula entire. Gill rakers 6+12, short tubercles, about 2/5 of gill filaments, which 1 1/5 in eye. Scales with 9 to 12 basal radiating striae, edge entire; circuli very fine, none apical. Scales adherent, in even longitudinal rows parallel with lateral line, except convergence behind; 6 rows of enlarged scales on cheek, with minute ones interspersed; scales in lateral line small, with small simple tubes. Third dorsal spine 3 1/4 in head; first dorsal ray 2 2/5; second anal spine 4; first anal ray 2 1/4; caudal 1 4/5, hind edge truncate, convex as expanded; pectoral 1 3/5; ventral 2 1/10.

Brownish, color of back sharply contrasted with paler under surface of head, belly and tail, by white band of 1 or 2 scales in width, extending from above pectoral base to below end of lateral line on caudal base; on head reflected and obscured as broad pale area across cheek and opercle. Back with traces of 7 rather obscure deep brown saddles, much wider than interspaces. Round deep brown spots crowded along back above pale lateral band, though most begin about opposite end of pectoral, larger and most conspicuous about lateral line below soft dorsal. Along lower boundary of whitish lateral band some obscure brownish spots. Fins largely uniform pale brownish, though a few obsolete dark spots about middle of caudal base and caudal fin with narrow dark brown edges above and below. Also traces of some obscure dark spots along soft dorsal base. Iris brownish. Length 194 mm.

One in the Agassiz Museum from the "Sandwich Islands" obtained by Andrew Garrett.

Paracirrhites polystictus (Günther).

Cirrhites polystictus Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 70, pl. 50, fig. A, 1874 (type loc., Kingsmill Islands and Tahiti).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 13, 1877 (Raiatea).

Paracirrhites polystictus Fowler: B. P. Bishop Mus., Bull. 22, p. 10, 1925 (Guam).

Head 2 7/8; depth 3; D. X, 11, 1; A. III, 6, 1; scales 49 in lateral line to caudal base and 4 more large ones on latter; 7 scales above lateral line, 11 below; 12 large predorsal scales to occiput; snout 2 7/8 in head from upper jaw tip; eye 6 2/5; maxillary 2 2/3; interorbital 5. Least depth of caudal peduncle 1 1/8 in its width or 2 2/3 in total head length; head width 2. Vomer with

patch of small teeth, none on palatines. Second dorsal spine 3 1/2 in head; first dorsal ray 2 1/3; second anal spine 3 1/3; first anal ray 2; caudal 1 1/2; pectoral 1 3/4, rays II, 6+VII; ventral 2.

One in the Bishop Museum from Guam in 1900 and another in July, 1923. The National Museum has a specimen 220 mm. long from Tuamotu, obtained by the Wilkes Expedition.

Very similar to *Paracirrhites hemistictus* but only head, breast, and paired fins immaculate, rest covered with dark spots.

Paracirrhites forsteri (Schneider).

Grammistes forsteri Schneider: Systema ichth., Bloch, p. 191, 1801 (type loc., Saint Christine or Waitaho, Marquesas Islands).

Amblycirrhites forsteri Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).

Cirrhites forsteri Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, p. 308, 1868 (Savay).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Savay).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 69, pl. 49, fig. A, 1874 (Polynesia; Tahiti; Hawaii).—Streets: U. S. Nat. Mus., Bull., vol. 7, p. 73, 1877 (Honolulu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 248, 1882 (New Guinea).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 502, 1900 (Honolulu).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 90, 1901 (Honolulu).

Paracirrhites forsteri Bleeker: Atlas ichth., vol. 8, p. 144, pl. (71) 349, fig. 5, 1876-77 (Waigiu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 17, 19, 1902 (Honolulu).—Bryan and Herre: op. cit., vol. 2, no. 1, p. 131, 1902 (1903) (Marcus Island).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 490, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 527, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 450, pl. 67, 1903 (1905) (Honolulu; Hilo).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 51, 1906 (Nukuhiva).—Fowler: Copeia, 112, p. 83, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus. Bull. 22, pp. 11, 27, 1925 (Guam; Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 16, 1925 (Ocean and Laysan Islands).—Fowler: op. cit., Bull. 38, p. 18, 1927 (Midway Island).

Cirrhites pantherinus Cuvier: Hist. nat. Poiss., vol. 3, p. 52, 1829 (Saint Christine or Waitaho, Marquesas).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).

Perca taeniata (Forster) Cuvier: Hist. nat. Poiss., vol. 3, p. 55, 1829 (name in text).—Lichtenstein: Descriptiones animalium, Forster, p. 224, 1844 (Saint Christine or Waitaho).

A very handsome species, the head and front of the trunk with deep red spots, a median pale lateral band with blackish one alongside above on tail.

The Bishop Museum has 16 from Honolulu, 2 Marcus Island, and 1 Nukuhiva. Largest 192 mm. I also examined 90 specimens in the Honolulu markets in December, 1922, and January, 1923. One from Ocean Island by the Tanager and 1 from Guam in 1923. In the National Museum 1 from Fiji, obtained by the Wilkes Expedition. Also 3 Hawaiian specimens through the Bureau of Fisheries and 1 from Honolulu through T. H. Streets. In the Agassiz Museum 2 from the Society Islands and 1 from Ebon Island, Marshall Islands, all through Andrew Garrett. Six Hawaiian specimens in the Academy 113 to 152 mm.

Red Sea, Zanzibar, Mauritius, India, East Indies, Polynesia, Hawaii.

Paracirrhites arcatus (Cuvier).

Cirrhites arcatus Cuvier: Hist. nat. Poiss., vol. 3, p. 55, 1829 (type loc., Mauritius; Tahiti).—Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, p. 308, 1868 (Savay, Samoa).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Savay).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 70, pl. 49, figs. B-C, 1874 (Hawaii; Society Islands; Samoa; Solomons).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 13, 1877 (Ponapé).—Günther: Rept. voyage "Challenger," vol. 1, p. 59, 1880 (Honolulu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 265, 1883 (southeast New Guinea).

Perca arcata (Parkinson) Cuvier: Hist. nat. Poiss., vol. 3, p. 55, 1829 (name in text).

Cirrhitus arcatus Gill: Acad. Nat. Sci. Philadelphia, Proc., p. 107, 1862 (Hawaii).

Cirrhites arcuatus Günther: Cuise of "Curaçoa," (Brenchley), p. 409, 1873 (Solomons).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 372, 1897 (Rotuma Island).

Paracirrhites arcatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 79, 1900 (1901) (Guam).—Seale: op. cit., vol. 1, no. 5, pp. 16, 17, 1903 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 491, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 527, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 450, pl. 69, 1902 (1904) (Honolulu; Hilo; Kailua).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 27, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 16, 1925 (Ocean Island).—Fowler: op. cit., Bull. 38, p. 18, 1927 (Palmyra Island).

Cirrhites (*Amblycirrhites*) *arcatus* Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 490, 1901 (Honolulu).

?Cirrhites vittatus Cuvier: Regne animal, 2nd ed., vol. 2, p. 146, 1829 (on Renard, Poiss. Moluques, vol. I, XVIII, p. 102, 1718-19).

Differs from *Paracirrhites forsteri* in the absence of spots on the head and body anteriorly and in the presence of a large brown postocular ocellus.

In the Bishop Museum 31 from Honolulu, 1 from Honomuni on Molokai in July, 1914, from W. A. Bryan, 2 from Palmyra obtained by Thurston and Thaanum in 1922 and 1 from Guam. I found 10 specimens in the Honolulu market December 24, 1922. One from Ocean Island by the Tanager Expedition. In the National Museum a series of Hawaiian specimens and 1 from Honolulu obtained by W. H. Pease. The Agassiz Museum contains 2 Hawaiian specimens from Hawaii and 3 from Society Islands from Andrew Garrett.

Red Sea, East Indies, Melanesia, Micronesia, Polynesia, Hawaii.

Paracirrhites melanotus (Günther).

Cirrhites melanotus Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 72, pl. 52, fig. C, 1874 (type loc., Raiatea and Society Islands).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 13, 1877 (Pelew Islands).

Paracirrhites melanotus Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 16, 1925 (Wake Island).

Head 2 7/8 to 3; depth 2 1/4 to 2 1/2; D. X, 13, 1; A. III, 6, 1; scales 34 to 37 in lateral line to caudal base and 2 or 3 more on latter; 5 or 6 scales above lateral line, 10 or 11 below, 7 predosal; snout 3 1/3 to

4 in head; eye 3 to 3 1/3; maxillary 2 1/2 to 2 3/5; interorbital 5 1/6 to 5 1/4.

Body compressed, oblong-ovoid. Caudal peduncle strongly compressed, length 2/3 to 3/4 its least depth, which 2 1/4 to 2 2/5 in head. Head width 1 2/3 to 2 1/10 in its length. Snout conic, length 4/5 its width. Eye with hind edge midway in head; little longer to equal to snout length, greater than interorbital. Mouth rather small, lower jaw slightly shorter. Maxillary reaches opposite front eye edge, very oblique; expansion 2 1/2 to 2 4/5 in eye. Teeth fine, conic, close-set, in narrow bands in jaws; above 2 close-set canines each side anteriorly, sometimes single; below 1 to 4 close-set canines each side, sometimes variously asymmetrical. Front nostril about last fourth in snout; hind nostril higher, close before front eye edge. Interorbital slightly concave. Hind preopercle edge with 7 to 9 rather large serrae. Gill rakers 5+11, lanceolate, 1 1/4 in gill filaments, which 1/3 of eye.

Scales with 6 or 7 marginal parallel or radiating basal striae; circuli very fine. Scales on cheek minute. Small scales on all fins basally. Lateral line little arched and nearly parallel with profile of back, slopes down till nearly median at caudal base; tubes small, simple, little exposed. Third dorsal spine 2 1/5 to 2 3/4 in head, first ray 2 to 2 1/6; second anal spine 2 to 2 1/8, second ray 1 3/4 to 1 7/8; caudal 1 2/5 to 1 1/2, convexly rounded behind; pectoral 1 1/10 to 1 1/8; ventral 1 2/5 to 1 1/2.

Back blackish-brown, sharply defined forward from occiput to soft dorsal base, also including bases of both dorsals. Narrow superciliary border and broader infrapostorbital border of blackish-brown. Dusky spot on upper lip above and on lower lip below symphysis. Terminal portions of dorsals and most fins whitish. Body otherwise, including median longtitudinal area of interorbital, yellowish-white. Iris silvery-white. Length 33 to 50 mm.

In the Bishop Museum 4 from Wake Island, obtained by the Tanager Expedition in 1903. The Agassiz Museum has 6 from the Society Islands obtained by Andrew Garrett.

Paracirrhites cinctus (Günther).

Cirrhites cinctus Günther: Cat. fishes Brit. Mus., vol. 2, p. 73, 1860 (type loc., Hawaiian islands; Madagascar; Mauritius).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 72, pl. 52, figs. A-B, 1874 (Hawaiian islands).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 490, 1901 (Honolulu).

Paracirrhites cinctus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 16, 19, 1902 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 491, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 527, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 449, pl. 68, 1903 (1905) (Hilo; Honolulu).—Fowler: Copeia, no. 112, p. 82, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 38, p. 18, 1927 (Christmas Island).

Cirrhites faciatus (non Cuvier) Bennett: Zool. Jour., vol. 4, p. 39, 1828 (Hawaiian islands).

A beautiful little fish pale or whitish with 4 or 5 transverse deep red bands and the head mottled with pearly and olive.

The Bishop Museum contains 30 specimens from Honolulu, largest 117 mm. In the National Museum 7 Hawaiian specimens. The Agassiz Museum has 6 Hawaiian specimens, of which 1 obtained by Andrew Garrett, who also obtained another at Kauai and 11 in the Society Islands. Three Hawaiian specimens in the Academy.

Quite likely *Cirrhites murrayi* Regan (Zool. Soc. London, Proc., vol. 1, p. 404, pl. 66, fig. 6, 1909, type loc., Christmas Island, Indian Ocean) is a synonym of this species. Its distribution would then extend westward to the Indian Ocean.

Mauritius, Hawaii.

ANTIGONIIDAE

Antigonia steindachneri Jordan and Fowler.

Antigonia steindachneri (Jordan and Evermann) Jordan and Fowler: U. S. Nat. Mus., Proc., vol. 25, p. 522, 1903 (type loc., Kailua).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 361, pl. 45, 1903 (1905) (Kailua and Hilo).—Gilbert: op. cit., vol. 23, pt. 2, p. 621, 1903 (1905) (near Laysan in 173 to 182 fathoms).—Fowler: B. P. Bishop Mus., Bull. 22, p. 27, 1925 (Honolulu).

Head 2 7/8; depth 1; D. VIII, 35, 1 to 37, 1; A. III, 32, 1 to 34, 1; snout 3 in head measured from upper jaw tip; eye 3 1/5; maxillary 4 1/5; interorbital 3 1/8. Least depth of caudal peduncle 2 3/5 in head. Head width 2 1/10 in its length. Third dorsal spine 1 1/2 in head; seventh dorsal ray 3 2/3; first anal ray 2 4/5; seventh anal ray 4 2/5; caudal 1 1/4; pectoral 1 1/10; ventral 1 2/5; ventral spine 1 1/2.

In the Bishop Museum 3 from Honolulu, 196 to 219 mm. I obtained 2 in the Honolulu markets December 31, 1922. The National Museum has 1 Hawaiian specimen, adult. In the Agassiz Museum a specimen without locality, as the "type" of *Hypsinotus schlegelii,* 158 mm. long. It has D. IX, 33, and A. III, 31.

Antigonia eos Gilbert.

Antigonia eos Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 621, pl. 80, fig. 1, 1903 (1905) (type loc., Pailolo Channel, Hawaii, in 122 to 132 fathoms).

Supposed to differ from *A. steindachneri* chiefly in D. IX, 32 to 34 and A. III, 30 or 31.

In the National Museum type and 8 paratypes from Hawaii.

MONODACTYLIDAE

Monodactylus argenteus (Linné).

Chaetodon argenteus Linné: Systema nat., 10th ed., p. 272, 1758 (type loc., Indies).

Psettus argenteus Schmeltz: Mus. Godeffroy, Cat. 4, p. 17, 1869 (Samoa).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 1, 1, p. 140, 1876 (Samoa).—Macleay: Linn. Soc. New South Wales, Proc., vol. 4, p. 63, 1879 (Solomons).—Günther: Rept. voyage "Challenger," vol. 1, p. 35, 1880 (Levuka, Fiji).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 266, 1883 (Normanby Island, New Guinea).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 18, p. 206, 1912 (Port Sandwich, New Hebrides).

Monodactylus argenteus Jordan and Seale: U. S. Bur. Fish., Bull., vol. 25, p. 237, fig. 30, 1905 (1906) (Apia).—Fowler: B. P. Bishop Mus., Bull. 22, p. 33, 1925, (Samoa).

Head 3 1/5; depth 1 2/5; D. VII, 1, 28, 1; A. III, v, 27, 1; scales 85 in lateral line to caudal base and 7 more on latter; 18 scales above lateral line, 44 below; snout 4 1/4 in head measured from upper jaw tip; eye 3; maxillary 3 1/4; interorbital 2 1/2; head width 1 3/4. Gill rakers 8+18, lanceolate, 1 2/3 in gill filaments, which 1 4/5 in eye. Scales with 1 to 4 basal radiating striae; apical spines minute, 70 to 83, basal

elements in 14 to 26 series; circuli extremely fine. Largely dull brownish, with bright brassy tinge. Fins all more or less brown.

One from Apia in the Academy 198 mm. Four adults in the National Museum from Apia.

Jouan evidently lists this under *Acanthopodus* from New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 261, 1861, Uitoë).

Red Sea, East Africa, India, Queensland, East Indies, Melanesia, Micronesia, Polynesia.

Monodactylus falciformis Lacépède.

Monodactylus falciformis Lacépède: Hist. nat. Poiss., vol. 3, p. 132, 1801 (no type locality) (on Commerson); op. cit., vol. 2, pl. 5, fig. 4, 1800.

Psettus commersonii Cuvier: Hist. nat. Poiss., vol. 7, p. 187, 1831 (type loc., Vanicolo).

Differs from *Monodactylus argenteus* in the increased gill rakers 20 to 24 on lower branch of first arch and body more slender or depth 1 1/2. According to Boulenger reaches 160 mm.

Red Sea, South Africa, India, Polynesia.

PLATACIDAE

Platax orbicularis (Forskål).

Chaetodon orbicularis Forskål: Descriptiones animalium, pp. XII, 59, 1775 (type loc., Djedda, Red Sea).

Platax orbicularis Schmeltz: Mus. Godeffroy, Cat. 4, p. 17, 1869 (Samoa).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 140, 1876 (Society Islands; Samoa).—Günther: Rept. voyage "Challenger," vol. 1, pp. 35, 56, 1880 (Kandavu, Fiji; Nares Harbor, Admiralty Islands).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 63, 1906 (Shortland Islands, Solomons).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol 25, p. 335, 1905 (1906) (Pago Pago and Apia).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 355, 1906 (Tahiti).—Fowler: B. P. Bishop Mus., Bull. 22, p. 11, 1925 (Guam).

Chaetodon pentacanthus Lacépède: Hist. nat. Poiss., vol. 4, pp. 454, 473, pl. 11, fig. 2, 1802 (type loc., The Great Ocean [Indo-Pacific]).

Platax eapi Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 170, 1830 (type loc., Venus Point, Tahiti).

Platax blochii Cuvier: Hist. nat. Poiss., vol. 7, p. 167, 1831 (type loc., Mauritius; Pondicherry; New Guinea).

Platax leschenaldi Cuvier: Hist. nat. Poiss., vol. 7, p. 168, 1831 (type loc., Pondicherry and New Guinea).

Platax expansus Thiollière: Fauna Woodlark, p. 168, 1857 (type loc., Woodlark Island).

Platax anagon (Montrouzier) Thiollière: Fauna Woodlark, p. 168, 1857 (name in synonymy).

Platax vespertilio Kittlitz: Denkw. Reise Mikronesien, vol. 2, p. 65, 1858 (Ualan).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).—Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).—Peters: Akad. Wiss. Berlin, Monatsb., p. 836, 1876 (1877) (Carteret Harbor, New Ireland).—Bleeker: Atlas ichth., vol. 9, p. 74, pl. (17) 379, fig. 1, pl. (18) 380, figs. 2-3, 1877 (Waigiu; New Guinea).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 359, 1882 (New Guinea).—Vaillant: Soc. Philom. Paris, Bull., 7th ser., vol. 11, p. 56, 1886-87 (Rikitea, Gambier Islands).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1391, 1906 (Upolu).

Platax arthritticus Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).

Platax batavianus Bleeker: Atlas ichth., vol. 9, p. 76, pl. (19) 381, figs. 1-2, 1877 (Waigiu).

Platax pinnatus Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 359, 1882 (New Guinea).

According to Bleeker distinguished from the next species by the front profile of the head forming an angle at the jaws, not evenly convex, and 18 to 20 scales above the arch of the lateral line to the dorsal base. Length 310 mm.

In the Bishop Museum 6 from Shortland Island, 23 to 53 mm. long. Five from Guam in 1923. The National Museum has an adult from Samoa and 1 young from Borabora. In the Agassiz Museum 2 from Society Islands, 1 Tongatabu and 1 from Ascension Island, Marshall Islands, through Rev. A. A. Strong, April 14, 1877.

Red Sea, Zanzibar, Mozambique, Madagascar, Mauritius, Seychelles, India, East Indies, China, Queensland, Melanesia, Micronesia, Polynesia.

Platax teira (Forskål).

Chaetodon teira Forskål: Descriptiones animalium, pp. XII, 60, 1775 (type loc., Lohaja, Red Sea).

Platax teira Thiollière: Fauna Woodlark, p. 170, 1857 (Woodlark Island).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).—Bleeker: Nat. Tijds. Ned Ind., vol. 22, p. 99, 1860 (New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 11, pt. 15, p. 141, 1876 (Pelew Islands).—Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 330, 1876 (Hall Sound, New Guinea).—Bleeker: Atlas ichth., vol. 9, p. 73, pl. (17) 279, fig. 2, pl. (20) 382, fig. 1, 1877 (New Guinea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 359, 1882 (New Guinea).—Jordan and Fowler: U. S. Nat. Mus., Proc., vol. 25, p. 526, 1903 (Bonin Islands).

Platax gaimardi Cuvier: Hist. nat. Poiss., vol. 7, p. 162, 1831 (type loc., New Guinea).

Platax orbicularis (non Forskål) Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 335, 1905 (1906) (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 306, 1911 (Bora Bora, Society Islands).

Head 3; head and trunk 4/5 of greatest depth; D. V, 34; A. III, 27; tubular scales 47 in lateral line to caudal base; 60 scales counted close along lateral line; 26 scales above arch of lateral line to dorsal base, 44 below; snout 2 3/4 in head; eye 2 2/3; maxillary 3; interorbital 2 3/5.

Body greatly compressed, back and abdomen greatly projected. Caudal peduncle strongly compressed, length half its depth, which 1 7/8 in head. Head width 1 3/4 in its length. Snout broad, obtuse, length 4/5 its width. Eye large, about midway in head, longer than eye or interorbital. Mouth broad, with short gape. Maxillary reaches opposite front pupil edge; expansion 3 in eye. Teeth compressed, ends tridentate. Front nostril slightly behind middle in snout; hind nostril vertical slit close before eye. Interorbital broadly convex. Gill rakers 9 + 9, weak, 1/4 of gill filaments, which 1 3/4 in eye. Scales with 4 or 5 basal radiating striae; apical denticles 18 to 20, transversely in 3 series; circuli fine. Bases of vertical fins finely scaled. Lateral line well arched, slopes down till midway along side of caudal peduncle; tubes well exposed. Dorsal and anal with greatly elongated anterior rays, greatly longer than combined head and trunk. Ventral long as combined head and trunk. Pectoral 1 1/3 in head. Caudal 2 1/5 in combined head and trunk.

Body deep brown. Broad seal brown band vertically through eye, little less in width than eye diameter. Another wider band from spinous dorsal to ventral bases. Tail deep brown. Dorsals, anals and ventrals

blackish. Caudal with blackish basal area, greater submarginal portion whitish. Pectoral pale olive. Length 103 mm.

One in the Agassiz Museum from Kusaie, Caroline Islands. One as *Platax orbicularis* from Samoa and 1 from Borabora in the National Museum.

Jouan evidently describes it as *Acanthinion* (Soc. Cherbourg, Mem., vol. 9, p. 111, 1863) from a specimen 450 mm. obtained at Port de France, New Caledonia: D. 30; A. 26; 3 strong imbedded spines before dorsal and 3 smaller before anal. Appearance triangular with sides rounded and snout at summit; snout obtuse, front nearly vertical. Caudal little emarginate. Brownish or grayish, with deeper transverse bands, fading after death.

Red Sea, Zanzibar, Mozambique, Madagascar, Seychelles, India, East Indies, China, Queensland, Melanesia, Micronesia, Polynesia.

EPHIPPIDAE

Drepane punctata (Linné).

Chaetodon punctatus Linné: Systema nat., 10th ed., p. 273, 1758 (type loc., Asia).

Drepane punctata Cuvier: Hist. nat. Poiss., vol. 7, p. 99, 1831 (Doreh Harbor, New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Samoa).—Günther: Mus. Godeffroy, Jour., vols 2-3, pts. 5-6, p. 55, 1874 (copied).

Drepane punctatus Peters: Akad. Wiss. Berlin, Monatsb., p. 833, 1876 (1877) (New Ireland).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 244, 1882 (New Guinea).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1391, 1906 (Samoa).

Harpochirus punctatus Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).—Bleeker: Atlas ichth., vol. 9, p. 19, pl. (3) 365, fig. 4, 1877 (Waigiu, New Guinea).

D. IX, 21 or 22; A. III, 17 to 19; scales 53 in lateral line to caudal base, tubes 42 to 45; pectoral nearly reaches caudal base. Gray above, silvery below; 6 brownish transverse bands, alternating with slightly narrower ones, sometimes absent. Reaches over 300 mm.

Red Sea, East Africa, Natal, India, East Indies, China, Queensland, Melanesia, Polynesia.

TOXOTIDAE

Toxotes jaculator (Pallas).

Sciaena jaculatrix Pallas: Philos. Trans., vol. 56, p. 187, pl. 8, fig. 6, 1766 (type loc., Batavia, Java).

Toxotes jaculator Cuvier: Hist. nat. Poiss., vol. 7, p. 234, pl. 192, 1831 (Doreh Harbor, New Guinea).—Thiollière: Fauna Woodlark, p. 171, 1857 (Woodlark Island).—Bleeker: Atlas ichth., vol. 9, p. 4, pl. (1) 363, fig. 4, 1877 (New Guinea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 245, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 263, 1883 (Normanby Island, New Guinea).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 18, 1885 (Rubi, New Guinea).—Ramsay and Ogilby: Linn. Soc. New South Wales, Proc., ser. 2, vol. 1, p. 8, 1886 (Strickland River, New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 63, 1906 (Shortland Island, Solomons).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 111, 1913 (Majalibit Bay, Waigiu).

Archer azium (Montrouzier) Thiollière: Fauna Woodlark, p. 171, 1857 (name in synonymy).

Head 2 1/3; depth 2 1/8; D. IV, 12 or 13; A. III, 15 to 17; scales 28 to 30 in lateral line, 3 or 4 above, 9 or 10 below, 23 predorsal; eye 3 to 4 in head. Back with 5 dark transverse blotches. Length 235 mm. (Bleeker)

Four in the Bishop Museum from Shortland Island, 147 to 174 mm.

Andamans, East Indies, Queensland, Melanesia.

Toxotes chatareus (Buchanan-Hamilton).

Coius chatareus Buchanan-Hamilton: Fishes of Ganges, pp. 101, 370, pl. 14, fig. 34, 1822 (type loc., Ganges mouths).

Toxotes chatareus Weber: Nova Guinea, vol. 5, pt 2, p. 244, 1908 (Jamur Lake, Urama basin, South New Guinea).—Weber: op. cit., vol. 9, pt. 4, p. 571, fig. 29, 1913 (Varen River, Varlaten Bocht, Lorentz River, Bivak Island, Regen Island, Alkmaar, Sande River).—Regan: Zool. Soc. London, Trans., vol. 20, pt. 6, p. 276, 1914 (Mimika River, New Guinea).

Head 2 3/5; depth 2 1/10; D. V, 12 to 14; A. III, 17 or 18; scales 33 or 34 in lateral line, 4 above, 11 or 12 below, 22 predorsal; eye 4 in head. Irregular longitudinal row of 6 to 8 dusky to blackish blotches on back. Length 152 mm. (Bleeker)

Burmah, Malay Peninsula, East Indies.

Toxotes oligolepis Bleeker.

Toxotes oligolepis Bleeker: Kon. Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 9, p. 162, 1876 (type loc., Batjan or Buru?).

Head 2 2/5; depth 2 1/3; D. V, 11 or 12; A. III, 16 or 17; scales 23 or 24 in lateral line, 4 above, 9 or 10 below, 22 predorsal; eye 3 1/3 in head. Five broad, transverse, dusky bands on back. Length 141 mm. (Bleeker)

Two in the National Museum from New Guinea, 165 and 203 mm. long.

East Indies.

Toxotes lorentzi Weber.

Toxotes lorentzi Weber: Leyden Mus., Notes, vol. 32, no. 4, p. 232, 1910 (type loc., Merauke, Dutch South New Guinea).—Weber: Nova Guinea, vol. 9, pt. 4, p. 572, 1913 (Merauke).

Head 3; depth 2 1/4; D. V, 13 or 14; A. III, 15 or 16; scales 46 in lateral line, 7 above, 13 below; eye 3 3/4 to 4 in head. Back dark gray-brown, pale to yellowish below; vertical fins dark, paired transparent with dark spots. Length 115 mm. (Weber)

SCATOPHAGIDAE

Scatophagus argus (Linné).

Chaetodon argus Linné: Systema nat., 12th ed., p 464, 1766 (type loc., India).

Scatophagus argus Kner: Reise "Novara," Fische, vol. 1, p. 106, 1865 ("Tahiti").—Peters: Akad. Wiss. Berlin, Monatsb., p. 833, 1876 (1877) (New Britain).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 244, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 263, 1883 (Normanby Island, New Guinea).—Weber: Nova Guinea, vol. 5, pt. 2, p. 249, 1908 (Merauke River mouth, New Guinea).—Weber: op. cit., vol. 9, pt. 4, p. 588, 1913 (Lorentz River at Bivak Island).

Back and sides covered with large dark blotches. Reaches 300 mm.

One in the National Museum 67 mm. from New Guinea.

India, East Indies, China, Australia, Melanesia.

Scatophagus tetracanthus (Lacépède).

Chaetodon tetracanthus Lacépède: Hist. nat. Poiss., vol. 4, 1802, pp. 726, 727 (no type locality).

Scatophagus multifasciatus Richardson: Voyage "Erebus" and "Terror," Fishes, p. 57, pl. 35, figs. 4-6, 1844-48 (type loc., King George's Sound, Australia).—Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 277, 1876 (Hall Sound, New Guinea).—Macleay: op. cit., vol. 7, p. 244, 1882 (New Guinea).

Back with dark vertical bands and lower sides with dark spots or blotches. Reaches 400 mm.

Two in the National Museum from New Guinea, 93 to 97 mm. Each with 7 transverse dark bars on back and scattered dark spots below middle of body on sides.

East Africa, Australia, New Guinea.

CHAETODONTIDAE

According to Jordan and Evermann (U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 374, 1903 [1905]) *Chaetodon humeralis* Günther (Cat. fishes Brit. Mus., vol. 2, p. 19, 1860, type loc., Hawaiian islands; Zool. Soc. London, Trans., vol. 6, p. 419, pl. 65, fig. 3, 1869) has been erroneously recorded from the Hawaiian region.

Possibly an unidentifiable *Chaetodon* is that noticed by Jouan, with the vernacular "Memmbeh" from Baie du Sud, New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 259, 1861). Condensed it is as follows:

Depth 1 1/2; D. XI, 14; A. IV, 13. Body nearly right-angled, very compressed. Snout somewhat elongate. Eye medium, more than 2 in interorbital. Small convex teeth in jaws. Hind preopercle edge vertical, entire. Opercle emarginate, forms spine behind. Dorsal spines short, first very small, fifth longest and last long as fifth. Soft dorsal triangular, hind edge vertical. Anal like dorsal, spines short and strong. Caudal large, right-angled. Pectoral very small, broadly rounded. Ventral long. Body covered with large rough scales, gray-green, with black spots, placed regularly like mosaic. Length 280 mm.

Chaetodon meyeri Schneider.

Chaetodon meyeri Schneider: Systema ichth., Bloch, p. 223, 1801 (type loc., Moluccas).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 2, 1859 (Doreh, New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 13, 1877 (Pelew Islands).—Ahl: Arch. naturg., vol. 89, p. 49, 1923 (Ralum; Jaluit).

Tetragonoptrus (*Citharoedus*) *meyeri* Bleeker: Atlas ichth., vol. 9, p. 32, pl. (14) 378, fig. 5, 1877 (New Guinea).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

D. XII, 23; A. III, 20; scales 52 in lateral line, 7 above, 27 below. Body, head and fins with curved black stripes; 1 across lower lip; second around snout; third from nape through eye to ventral base; these stripes yellow edged; fourth from first dorsal spine to suprascapula; fifth from upper edge of dorsal bent down to preopercle edge, then along abdomen and basal half of anal; sixth concentric with former, touching opercle edge and pectoral base, proceeding to upper part of caudal base; seventh, eighth and ninth curved, radiate from pectoral root; caudal with 2 narrow cross stripes; opercle with white vertical streak. (Günther)

East Indies, Melanesia, Micronesia.

Chaetodon ornatissimus Cuvier (Pl. XXII, *B*).

Chaetodon ornatissimus (Solander) Cuvier: Hist. nat. Poiss., vol. 7, p. 17, 1831 (type loc., Tahiti).—Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 179, pl. 30, fig. 1, 1830 (1831) (Matavai Bay, Tahiti).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (1860) (Doreh, New Guinea).—Günther: Cat. fishes Brit. Mus., vol. 2, p. 15, 1860 (type of *Chaetodon ornatus* Gray).—Kner: Reise "Novara," Fische, vol. 1, p. 98, 1865 (Tahiti).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Samoa).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 38, pl. 30, fig. B, 1874 (Hawaiian islands).—Schmeltz: op. cit., Cat. 5, p. 24, 1874 (Samoa; Tahiti).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 262, 1883 (southeast New Guinea).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 513, 1900 (Hawaii).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 100, 1900 (Guam).—Seale: op. cit., vol. 1, no. 5, pp. 16, 19, 1902 (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 373, pl. 53, 1903 (1905) (Honolulu).—Seale: op. cit., vol. 4, no. 1, p. 65, 1906 (Rarotonga).—Jordan and Seale: (U. S.) Bur. Fish., vol. 25, p. 345, 1905 (1906) (Pago Pago; Apia).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 355, 1906 (Tahiti).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 59, Dec., 1922 (Hawaii).—Ahl: Arch. Naturg., vol. 89, p. 51, 1923 (Samoa; Ralum; Matupi).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 27, 34, 1925 (Honolulu; Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 17, 1925 (Johnston and Wake islands).

Tetragonoptrus (*Citharoedus*) *ornatissimus* Bleeker: Atlas ichth., vol. 9, p. 32, pl. (11) 375, fig. 2, 1877 (New Guinea).

Chaetodon ornatus Gray: Zool. miscellany, p. 33, 1831 (type loc., Hawaiian islands).—Gray: Animal kingdom, Griffiths, vol. 10, p. 323, pl. 20, 1834 (name only).

Chaetodon ornatissimus var. *kaupi* Ahl: Arch. Naturges., vol. 89, p. 52, 1923 (type loc., Samoa; Ralum; Matupi).

Head 3 1/4 to 3 7/8; depth 1 2/5 to 1 1/2; D. XIII, 26, 1 or 27, 1; A. III, 21, 1 or 22, 1; scales 55 to 57 from head to caudal base; tubes 45 to 51 in lateral line; 11 to 13 scales above lateral line, 31 below; snout 2 7/8 to 3 in head; eye 3 2/5 to 3 1/2; maxillary 3 1/2; interorbital 2 1/2.

Gill rakers 5 + 21, short, rather firm, lanceolate, 1/5 of gill filaments, which 1 2/5 in eye. Scales with 5 to 8 basal radiating striae; apical denticles 61 to 65, basal elements in 7 to 14 series; circuli very fine.

Dull brownish generally. Seven obliquely longitudinal bands of darker brown, each bordered obscurely with darker and each band about 2 scales in width. Dusky-brown vertical band from occiput, through eye, wide as pupil, continued below on breast, each border with yellowish line. Parallel dusky-brown vertical line delimits jaws, lower of which dusky. Dark vertical line from suprascapula along preopercle edge, wider above and another along hind opercle edge. Dark vertical line touches eye behind and extends up over spinous dorsal longitudinally to become marginal on soft dorsal. Broad gray-brown band on anal submarginally, bordered with dark lines. Edges of soft dorsal and anal narrowly dusky. Caudal with median dusky-brown vertical band and edge whitish, with submarginal brown band, broadest medianly.

The Academy has a dry specimen from Hawaii received from J. K. Townsend and 1 from Apia. Larger 120 mm. The Bishop Museum has 13 from Honolulu, 1 from Marcus Island, 7 Raro-

tonga, 2 Guam. Largest 129 mm. I found 60 specimens in the Honolulu markets in December, 1922. Three from Johnston Island and several from Wake Island in 1923. In the National Museum 3 Hawaiian specimens of which 1 adult from Steinberger, 1 Honolulu, 3 Apia. The Agassiz Museum has 7 from Hilo and 2 from the Society Islands, all obtained by Andrew Garrett.

Jordan and Evermann (1905) give the spines as 22, though their figure shows but 12. Resembles *Chaetodon meyeri* in general color-pattern, though longitudinal bands greatly broader.

East Indies, Melanesia, Micronesia, Polynesia, Hawaii.

Chaetodon pelewensis Kner.

Chaetodon pelewensis Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, p. 306, 1868 (type loc., Pelew Islands).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Samoa).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 43, pl. 31, fig. B, 1874 (Pelew Islands, Samoa, Society Islands, Tuamotus, New Hebrides).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 64, 1906 (Faté).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 340, 1905 (1906) (Apia; Pago Pago).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 123, 1922 (Pago Pago).

Chaetodon pelevensis Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 372, 1897 (Rotuma).

Chaetodon punctato-fasciatus (non Valenciennes) Günther: Cat. fishes Brit. Mus., vol. 2, p. 515, 1860 (Aneiteum).

Chaetodon pelewensis germanus Ahl: Arch. Naturg., vol. 89, p. 103, 1923 (Südsee).

Head 3 1/4; depth 1 2/3; D. XIII, 23, 1; A. III, 18, 1; scales 45 from head to caudal base; tubes 41 in lateral line; 8 scales above lateral line, 19 below; snout 2 2/3 in head; eye 3 1/8; maxillary 3 7/8; interorbital 3 1/5.

Head width 2 1/8 in its length. Gill rakers 3+14, slender, lanceolate, weak, 1/5 of gill filaments, which 1/2 of eye. Scales with 12 or 13 basal radiating striae; apical denticles 66 to 78, basal elements in 7 to 10 series; circuli very fine.

Brown, paler on breast and belly. Pale vertical bar, wide as pupil, through eye, short above, below not beyond preopercle, edges dark and adjacent region darker brown. Saddle-like black blotch, little less than eye, just below spinous dorsal origin. On trunk 8 oblique dusky-brown bands, extending on dorsal fins, lowest along soft dorsal base, each separated by narrow parallel duller brown line. On costal region and about pectoral lines all give place to dark spots. Soft dorsal edge narrowly white, then narrow submarginal pale yellowish line, bounded inside by black line. Anal similar, only submarginal bands wider. Caudal whitish, with basal yellow crescent next to subbasal black one. Ventral with dusky tints.

The Academy has a specimen from Pago Pago, 80 mm. long. In the National Museum 4 from Apia. The Agassiz Museum has 1 from the Society Islands, obtained by Andrew Garrett, 70 mm. long.

Chaetodon bennetti Cuvier.

Chaetodon bennetti Cuvier: Hist. nat. Poiss., vol. 7, p. 64, 1831 (type loc., Sumatra).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 241, 1882 (New Guinea).—Ahl: Arch. Naturg., vol. 89, p. 73, 1923 (New Guinea; Apaman Island).

Chaetodon bennettii Schmeltz: Mus. Godeffroy, Cat. 5, p. 24, 1874 (Apaman Island, Gilbert Group).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 37, pl. 29, fig. A, 1874 (Tuamotus, Society Islands, Gilbert Islands, Kingsmills).

Chaetodon vinctus Lay and Bennett: Zool. Beechey's voyage, p. 62, pl. 17, fig. 1, 1839 (type loc., Byam Martin Island [=Vairaatea, Paumotus]).

Head 2 1/4 to 3 1/2; depth 1 3/5 to 1 5/6; D. XIII or XIV, 17, 1 or 18, 1; A. III, 14, 1 to 16, 1; tubular scales 34 in lateral line; scales 45 or 46 in median lateral series from gill opening to caudal base medianly; 11 scales above lateral line to spinous dorsal origin, 20 below; snout 3 to 3 1/4 in head; eye 2 2/5 to 3 1/4; maxillary 3 3/4 to 4; interorbital 2 3/5 to 3 1/4.

Body well compressed, deeply ovoid. Caudal peduncle strongly compressed, least depth 2 2/5 to 3 1/6 in head. Head width 2 to 2 1/8 in its length. Snout conic, long as wide. Eye large, midway in head length; diameter greater to equal snout, or interorbital. Mouth small, lower jaw slightly projecting. Maxillary reaches opposite front nostril. Teeth in narrow brush-like bands in jaws. Front nostril at last fourth in snout; hind nostril close above front one. Interorbital convexly elevated. Preopercle edge spinescent. Gill rakers 4+14, short weak points, 1/5 of gill filaments, which 2 3/4 in eye. Scales with 7 to 16 basal radiating striae; apical denticles 125, or 36 to 45 in young, transverse series 6 to 8; circuli very fine. Scales above lateral line in series parallel with its course, below in nearly horizontal series. Fifth dorsal spine 1 2/5 to 1 2/3 in head; third dorsal ray 1 1/6 to 1 1/2; second anal spine 1 1/4 to 1 1/2; sixth anal ray 1 1/3 to 1 7/8; caudal 1 1/4 to 1 4/5, rounded behind; pectoral 1 to 1 1/3; ventral 1 1/10 to 1 1/6.

Brownish, paler on lower sides and below, where course of each row of scales with median pale streak. Broad deep brown band from predorsal down to eye, wider than pupil, but less than iris across cheek, not to chest, also both front and hind edge with rather broad whitish bordering line. White line obliquely from shoulder to front of soft anal base. Also faint line from lower pectoral base to anal origin. On side of back below front of soft dorsal large blackish-brown rounded blotch, little larger than eye, edged conspicuously and broadly with white. Caudal peduncle with broad transverse band, edged in front and behind with whitish. Length 20 to 143 mm.

In the Agassiz Museum 2 from Kingsmill Islands and 1 from the Society Islands, all obtained by Andrew Garrett.

East Indies, Melanesia, Micronesia, Polynesia.

Chaetodon fremblii Bennett (Pl. XXIII, *A*).

Chaetodon fremblii Bennett: Zool. Jour., vol. 4, p. 42, 1828 (type loc., Hawaiian islands).—Gray: Animal kingdom, Griffiths, vol. 10. p. 323, 1834 (name only).—Günther: Cat. fishes Brit. Mus., vol. 2, p. 16, 1860 (type).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 39, pl. 29, fig. B, 1874 (Hawaiian islands).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 70, p. 488, 1900 (Laysan).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 16, 1902 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 473, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 531, 1902 (1904) (Honolulu).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 944, 1904 (Honolulu; Laysan).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 375, pl. 51, 1903 (1905) (Honolulu; Hilo).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 59, Dec., 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 27, 1925 (Honolulu).—Fowler and Ball: B. P.

Bishop Mus., Bull. 26, p. 17, 1925 (French Frigates Shoal and Laysan).—Fowler: op. cit., Bull. 38, p. 19, 1927 (Honolulu).

Chaetodon frehmlii Cuvier: Hist. nat. Poiss., vol. 7, p. 18, 1831 (Hawaii).

Chaetodon tremblyi Gray: Animal Kingdom, Griffiths, vol. 10, pl. 13, 1834.

?Chaetodon bleekeri Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 21, 1902 (type loc., Honolulu [name only]).

The Bishop Museum has 12 from Honolulu, largest 158 mm. I found 242 secimens in the Honolulu markets during December, 1922. Five from French Frigates Shoal and 1 from Laysan in 1923. In the National Museum 4 from Hawaii and 1 from Laysan through Max Schlemmer. The Agassiz Museum has 1 adult from the Hawaiian islands and 4 from Hilo, Maui, and Honolulu, all through Andrew Garrett.

Only found in the Hawaiian subregion, this species is distinguished by its yellow ground color with 9 longitudinal blue lines.

Chaetodon speculum Cuvier.

Chaetodon speculum (Kuhl and Van Hasselt) Cuvier: Hist. nat. Poiss., vol. 7, p. 56, 1831 (type loc., Batavia, Java).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 242, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 263, 1883 (southeast New Guinea).—Ahl: Arch. Naturg., vol. 89, p. 75, 1923 (Matupi; New Pommerania).

Color-pattern very similar to *Chaetodon unimaculatus*, only no dark band posteriorly on soft dorsal, caudal peduncle and soft anal, dark blotch on lateral line greatly larger and body more elongate.

East Indies, Melanesia.

Chaetodon trifasciatus Mungo Park (Pl. XXIII, *B*).

Chaetodon trifasciatus Mungo Park: Linn. Soc. London, Trans., vol. 3, p. 34, 1797 (type loc., Sumatra).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 242, 1882 (New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 102, 1900 (Guam).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 474, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 372, pl. 52, 1902 (1903) (Honolulu).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1390, 1906 (Upolu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 344, 1905 (1906) (Apia).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 355, 1906 (Tahiti).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 64, 1906 (Raiatea; Shortland Island).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 307, 1911 (Suva, Fiji).—Kendall and Radcliffe: op. cit., vol. 35, p. 143, 1912 (Mangareva, Gambier Islands).—Ahl: Arch. Naturg., vol. 89, p. 56, 1923 (Samoa; New Guinea; New Pommerania; Ralum; Jaluit; Marshalls; Matupi; Bismarck Archipalago; New Mecklenburg; Talassia; Vulcan Island).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 12, 28, 34, 1925 (Guam; Honolulu; Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 17, 1925 (Johnston Island).

Tetragonoptrus (*Rabdophorus*) *trifasciatus* Bleeker: Atlas ichth., vol. 9, p. 35, pl. (15) 377, fig. 1, 1877 (Waigiu).

Chaetodon trifascialis Fowler and Silvester: Carnegie Inst., Marine Pap., p. 123, 1922 (Pago Pago).

Chaetodon vittatus Cuvier: Hist. nat. Poiss., vol. 7, p. 26, 1831 (Tahiti, Guam, Oualan).—Lay and Bennett: Zool. Beechey's voyage, p. 61, pl. 17, fig. 3, 1839 (Byam Martin Island).—Thiollière: Fauna Woodlark, p. 164, 1857 (Woodlark Island).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 2, 1859 (Doreh, New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Samoa).—Günther: Cruise of "Curaçoa" (Brenchley), p. 409, 1873 (Solomons).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts 5-6, p. 41, 1874 (Paumotus).—DeVis: Linn. Soc. New South Wales, Proc., vol. 8, p. 457, 1883 (Api).—Ogilby: Australian Mus., Records, vol. 1, p. 7, 1890-91 (Howla Island, Solomons).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 372, 1897 (Rotuma).—Pellegrin: Mus. Paris, Bull. 4, p. 229, 1898 (Saypan, Mariannes).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 16, 1902 (Honolulu).

Chaetodon tau-nigrum Cuvier: Hist. nat. Poiss., vol. 7, p. 29, 1831 (type loc., Guam).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 47, 1874 (copied).

Chaetodon bifascialis Cuvier: Hist. nat. Poiss., vol. 7, p. 37 (type loc., Guam).

Chaetodon bellus (Solander) Lay and Bennett: Zool. Beechey's voyage, p. 61, 1839 (name in synonymy).

Chaetodon ovalis Thiollière: Fauna Woodlark, p. 164, 1857 (type loc., Woodlark Island).

Head 3 1/3 to 3 1/2; depth 1 3/5 to 1 2/3; D. XIII, 22, 1 or 23, 1; A. III, 20 1; scales 42 to 44 from head to caudal base; tubes 33 to 38 in lateral line; 6 or 7 scales above lateral line, 14 or 15 below; snout 3 1/4 to 3 2/5 in head; eye 3 1/3 to 3 2/5; maxillary 3 3/4; interorbital 2 3/5 to 2 4/5; head width 1 4/5 to 1 7/8. Gill rakers 3+13, short, weak, lanceolate, 1/5 of gill filaments, which 1 1/3 in eye. Scales with 11 to 14 basal radiating striae, apical denticles 107 or 108; basal elements in 6 to 16 series; circuli very fine.

Dull brown generally, yellowish tint on sides. Dark oblique lines or streaks follow scale rows, most distinct on back. Dark brown band from occiput to eye and below, where meeting its fellow, less than eye in width; bordered above eye by narrow yellowish line each side and below eye wide yellowish band each side. On side of body to hind eye edge, then down to preopercle corner, narrow dark brown line. Muzzle, interorbital and mandible umber brown. Dark brown basal band along soft dorsal and anal bordered behind and edged narrowly yellowish. Two dull brown longitudinal lines on soft dorsal, fin narrowly white edged with submarginal dusky line. Soft anal edge narrowly whitish, then narrow yellow line, then narrow dusky line. Caudal with transverse deep brown band medianly, reddish in front and behind.

In the Academy 2 from Apia, 111 and 123 mm. The Bishop Museum has 10 from Honolulu, 2 Shortland Island and 1 Raiatea. Five from Johnston Island in 1923. In the National Museum 1 without locality, likely from Polynesia?, obtained by the Wilkes Expedition. Others are 1 from Honolulu through the Fur Seal Commission, 1 Hawaii through the Paris Museum, 2 young from Fiji, 12 Suva, 1 Fakarava, 3 Apia, 1 Mangareva, 2 New Guinea. The Agassiz Museum has 2 from Apia, 1 Ebon Island, Marshall Islands, through Rev. B. G. Snow on April 15, 1876, 1 Society Islands, 1 Kingsmill Islands, and 5 Hilo Bay, all from last 3 localities through Andrew Garrett.

Red Sea, Zanzibar, Mauritius, Seychelles, India, East Indies, Queensland, Melanesia, Micronesia, Polynesia, Hawaii.

Chaetodon ephippium Cuvier.

Chaetodon ephippium Cuvier: Hist. nat. Poiss., vol.

7, p. 61, pl. 174, 1831 (type loc., Moluccas; Borabora; Tahiti).—Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 174, pl. 29, fig. 1, 1830 (1831) (Beula Bay, Borabora).—Thiollière: Fauna Woodlark, p. 162, 1857 (Woodlark Island).—Günther, Cat. fishes Brit. Mus., vol. 2, p. 7, 1860 (Fiji).—Bleeker: Nat. Tijds. Ned., Ind., vol. 22, p. 99, 1860 (New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Samoa).—Günther: Cruise of "Curaçoa" (Brenchley), p. 409, 1873 (Solomons).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 36, pl. 27, figs. A-B, 1874 (Tonga; Society Islands).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 24, 1874 (Samoa; Tahiti).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 241, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 263, 1883 (southeast New Guinea).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 229, 1898 (Saypan, Mariannes).—Seale: B. P. Bishop Mus., Occ. Papers, 1, no. 3, p. 97, 1900 (Agaña, Guam).—Steindachner: Akad. Wiss. Wien, Stiz., vol. 115, pt. 1, p. 1390, 1906 (Upolu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 65, 1906 (Faté; Raiatea; Rarotonga).—Jordan and Seale: (U. S.) Bur. Fish., vol. 25, p. 343, 1905 (1906) (Kusaie, Carolines; Apia; Pago Pago).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 615, 1908 (Honolulu).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 49, p. 355, 1906 (Tahiti).—Ahl: Arch. Naturg., vol. 89, p. 65, 1923 (Ralum; New Pommerania; New Guinea; Bougainville Island; Jaluit; Samoa).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 12, 34, 1925 (Guam; Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 17, 1925 (Johnston and Wake Islands).

Tetragonoptrus (*Rabdophorus*) *ephippium* Bleeker: Atlas ichth., vol. 9, p. 36, pl. (16) 378, fig. 2, 1877 (Doreh, New Guinea).

Chaetodon garnoti Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 174, 1831 (name in synonymy).

Chaetodon mulsanti Thiollière: Fauna Woodlark, p 163, 1857 (type loc., Woodlark Island).

Chaetodon pepek (Montrouzier) Thiollière: Fauna Woodlark, p. 163, 1857 (name in synonymy).

Head 3 1/8 to 3 2/5; depth 1 3/4; D. XIII, 24, 1; A. III, 22, 1; scales 40 or 41 from head to caudal base; tubes 35 to 38 in lateral line; 12 scales above lateral line, 16 to 18 below; snout 2 3/4 in head; eye 4 to 4 1/8; maxillary 3 1/10 to 3 1/3; interorbital 3 1/5 to 3 1/2. Gill rakers 3+13, slender, lanceolate, weak, 1/5 of gill filaments, which 1 1/5 in eye. Scales with 8 to 10 basal radiating striae, 3 or 4 incomplete auxiliaries; apical denticles 94 to 112, basal elements in 10 to 22 series; circuli fine.

Pale brown generally. Hind half of back and most of soft dorsal black basally, bordered broadly below with cream-color, white fin edge with submarginal black line separating broad brown submarginal band. Obscure brown vertical band wide as pupil, reflected through eye. Obscure line vertically above pectoral origin and along hind edge of gill opening. From pectoral axil and inclined up to slightly behind third dorsal spine base, pale dusky line. Lower side with series of pale longitudinal bands, each traversing scale junctures.

Two in the Academy from Apia, 158 to 178 mm. In the National Museum 1 without locality, probably Hawaiian, obtained by the Wilkes Expedition. Others are 1 from Honolulu in 1908, 9 Apia and 2 New Guinea. The Bishop Museum has 6 from Honolulu, 3 Faté, 2 Raiatea, 1 Rarotonga, 4 Agaña on Guam as "Babong pinlalo." One from Johnston Island and 6 from Wake Island in 1923. In the Agassiz Museum 4 from the Society Islands, 1 Apia, and 6 from the Kingsmill Islands, first and last through Andrew Garrett.

Compared with Günther's figure the dark line from the pectoral axil is more pronounced and much narrower, and lower dull brown longitudinal bands at scale junctures, not in center of each row. One specimen also with longer dorsal filament, about 1 3/4 in combined head and trunk.

East Indies, Queensland, Melanesia, Micronesia, Polynesia, Hawaii.

Chaetodon semeion Bleeker.

Chaetodon semeion Bleeker: Nat. Tijds. Ned Ind., vol. 8, p. 450, 1855 (type loc., Cocos Islands, Indian Ocean).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Samoa).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 37, pl. 28, 1874 (Society Islands; Samoa).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 24, 1874 (Samoa; Tonga).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 492, 1899 (Thornton Island).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1390, 1906 (Upolu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 65, 1906 (Shortland Island).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 343, 1905 (1906) (Apia).—Ahl. Arch. Naturg., vol. 89, p. 69, 1923 (Samoa; New Pommerania; New Guinea).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 17, 1925 (Wake Island).

Head 3 1/5 to 3 1/3; depth 1 3/5 to 1 4/5; D. XIV, 21, 1 or 25, 1; A. III, 20, 1 to 22, 1; scales 33 or 34 from head to caudal base; tubes 35 in lateral line; 8 or 9 scales above lateral line, 15 or 16 below; snout 2 2/3 to 2 3/4 in head; eye 3 1/2 to 4 1/8; maxillary 3 1/4 to 4; interorbital 3 to 3 1/5.

Least depth of caudal peduncle 3 in head. Head width 1 7/8 to 2 in its length. Gill rakers 3+12, short points, 1/6 of gill filaments, which equal eye. Scales with 23 basal radiating striae; apical denticles 187, basal elements in 10 to 12 series. First dorsal spine 3 1/3 in head; fourth dorsal ray 2 7/8; dorsal filament extends nearly far back as caudal tips; fifteenth dorsal ray 2 1/4; third anal spine 2 1/10; tenth anal ray 1 7/8; caudal 1 3/5; pectoral 1 2/5; ventral 1 3/4.

Dried skin generally brownish. Each scale on trunk, except on head and breast with small dull greenish dot ocellated partly with paler, thus arranged in longitudinal rows. On dorsal bases spots not greatly increased but more scattered as scales numerous. Broad blackish band from predorsal to eye, widening below on cheek, though not to hind preopercle edge or embracing interopercle. Black line submarginally, or about middle in height, on spinous dorsal out and bordering upper edge of soft dorsal to and on filament. Blackish band begins on last half of spinous dorsal to become more intense over soft fin longitudinally. Soft dorsal with broad pale submarginal band separated from whitish edge by blackish line and from broad blackish median band by brown line. Anal like soft dorsal, only blackish median band much narrower forward.

In the Academy 2 dried skins from Thornton Island, larger 175 mm. One in the Bishop Museum from Shortland Island, 198 mm. Two from Wake Island in 1923. One in the National Museum from Apia. In the Agassiz Museum 3 fine adults from the Society Islands, obtained by Andrew Garrett, 183 to 203 mm.

A well-marked species, with each scale on trunk and tail with small dark spot.

Cocos Island, East Indies, Melanesia, Polynesia.

Chaetodon octofasciatus Bloch.

Chaetodon octofasciatus Bloch: Nat. ausländischen Fische, pt. 3, p. 113, pl. 215, fig. 1, 1787 (type loc., East Indies).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 17, 1885 (Rubi, New Guinea).—Ahl: Arch. Naturg., vol. 89, 84, 1923 (type; New Guinea, Matschin, Bougainville Island; Talassia, New Pommerania.

Tetragonoptrus (*Tetragonoptrus*) *octofasciatus* Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).

Head, body and fins with 7 or 8 deep brown to dusky narrow crossbands. A small species, about 100 mm. long.

India, East Indies.

Chaetodon miliaris Quoy and Gaimard (Pl. XXIV, *A*).

Chaetodon miliaris Quoy and Gaimard: Voyage "Uranie," Zool., p. 380, pl. 62, fig. 6, 1825 (type loc., Hawaiian islands).—Cuvier: Hist. nat. Poiss., vol. 7, p. 20, 1831 (Hawaiian islands).—Eydoux and Souleyet: Voyage "Bonite," Zool., vol. 1 p. 163, pl. 2, fig. 2, 1841 (Hawaiian islands).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Samoa).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 46, pl. 35, fig. A, 1874 (Hawaii).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 243, 1882 (New Guinea).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 512, 1900 (Hawaii).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 489, 1901 (Honolulu; Laysan).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 472, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 531, 1902 (1904) (Honolulu, Hanalei Bay, Laysan).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 944, 1904 (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 371, fig. 163, 1903 (1905) (Honolulu; Hilo).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 390, 1906 (Samoa).—Jordan and Seale: U. S. Bur. Fish., Bull., vol. 25, p. 344, 1905 (1906) (Apia).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 123, 1922 (Pago Pago).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 59, Dec. 1922 (Hawaii).—Ahl: Arch Naturg., vol. 89, p. 94, 1923 (Hawaiian islands, Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 17, 1925 (Laysan and French Frigates Shoal).

Tetragonoptrus (*Tetragonoptrus*) *miliaris* Bleeker: Atlas ichth., vol. 9, p. 39, pl. (15) 377, fig. 3, 1877 (New Guinea).

Chaetodon bellulus Thiollière: Fauna Woodlark, p. 165, 1857 (type loc., Woodlark Island).

Chaetodon mantelliger Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 394, fig. 7, 1899 (1901) (type loc., Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 16, 19, 1902 (Honolulu).

Chaetodon garretti Ahl: Arch. Naturg., vol. 89, p. 96, 1923 (on Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 46, pl. 35, fig. A, 1874).

Chaetodon punctulatus Ahl: Arch. Naturg., vol. 89, p. 97, pl. 2, fig. 8, 1923 (type loc., Amboina; New Guinea).

Head 2 4/5 to 3 3/4; depth 1 3/5 to 1 3/4; D. XIII, 22, 1 or 23, 1, seldom 20, 1; A. III, 19, 1, sometimes 18, 1; scales 48 to 50 from head to caudal base; tubes 38 to 40 in lateral line; 8 to 10 scales above lateral line, 22 or 23 below; snout 3 to 3 1/6 in head; eye 2 1/2 to 3 2/5; maxillary 3 3/5 to 4; interorbital 3 to 3 1/5; head width 1 7/8 to 2 1/6. Gill rakers 6+13, slender, short, weak, lanceolate, 1/4 of gill filaments, which 1 1/2 in eye. Scales with 8 to 12 basal radiating striae; apical denticles 32 to 105, basal elements in 2 to 13 series; circuli very fine.

Pale brown generally. About 11 vertical rows of dark brown spots on side and back, some extending above among smaller dark spots on bases of dorsal fins. Deep brown band from predorsal to eye and down on side of cheek, less than eye width and much narrower below. Band of blackish-brown around caudal peduncle. Soft dorsal edge narrowly whitish, with close submarginal dusky line. Though young show about 7 vertical rows of dark spots color-pattern otherwise like adult.

The Academy has a series of Hawaiian specimens, 1 from Thomas Nuttall, 2 J. K. Townsend, 1 W. H. Jones, 3 Bureau of Fisheries. Also 4 from Pago Pago. Length 20 to 155 mm. The young specimens show:

Scales 34 to 38 from head to caudal base; tubes 30 to 32 in lateral line; snout 3 1/8 to 3 3/4 in head; eye 2 2/5 to 2 3/4; maxillary 2 3/4 to 3 4/5; interorbital 2 1/2 to 3 1/10. Dull brownish, paler below. Narrow darker line median along each row of trunk scales. Blackish-brown band from occiput to eye and across lower surface of head, though little wider than pupil, narrowed below. Some examples often with brownish spot at front of breast. Blackish band across front of caudal peduncle, with short white bar on prong forward below from above and same upward from below. Lower anal edge blackish, with whitish bar adjoining submarginally. The dorsal spines constantly 13.

The National Museum has 7 from Maui, obtained by the Wilkes Expedition. Also type of *Chaetodon mantelliger,* besides 11 other Hawaiian specimens. The Bishop Museum has 30 from Honolulu, largest 156 mm. I found 167 specimens in the Honolulu markets during November and December, 1922. One from French Frigates Shoal, 5 from Johnston Island and 4 from Wake Island in 1923. In the Agassiz Museum 12 Hawaiian specimens, of which 1 adult from Andrew Garrett and 9 from Hilo and Poona.

Zanzibar, Ceylon, East Indies, Melanesia, Polynesia, Hawaii.

Chaetodon citrinellus Cuvier.

Chaetodon citrinellus (Broussonet) Cuvier: Hist. nat. Poiss., vol. 7, p. 21, 1830 (type loc., Guam; Tahiti).—Günther, Cat. fishes Brit. Mus., vol. 2, p. 33, 1860 (Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Samoa).—Günther: Cruise of "Curaçoa" (Brenchley), p. 409, 1873 (Solomons).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 47, pl. 35, fig. B, 1874 (Paumotus, Society Islands, Bonham Islands, Samoa, Fiji).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 262, 1883 (southeast New Guinea).—Boulenger: Ann. Mag. Nat. Hist. London, 6th. ser., vol. 20, p. 372, 1897 (Rotuma).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 98, 1900 (Agaña, Guam).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1390, 1906 (Upolu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 65, 1906 (Faté, Raiatea, Rarotonga, Tahiti).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 344, 1905 (1906) (Pago Pago and Apia).—Ahl: Arch. Naturg., vol. 89, p. 84, 1923 (New Guinea; Jaluit; New Hannover).

Chaetodon punctatus (Parkinson) Cuvier: Hist. nat. Poiss., vol. 7, p. 21, 1831 (type loc., Tahiti).

Chaetodon miliaris (non Quoy and Gaimard) Bleeker:

Atlas ichth., vol. 9, p. 39, pl. 15, 1877 (New Guinea; part).

Chaetodon citrinellus var. *semi-punctatus* Ahl: Arch. Naturg., vol. 89, p. 104, 1923 (on Günther; Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 47, pl. 35, fig. B, 1874).

Head 3 to 3 1/4; depth 1 3/5 to 1 3/4; D. XIV, 21, varies 20, 1 or 22, 1, rarely XV, 19, 1 or 20, 1; A. III, 16, 1, varies 1, 15, 1 or 17, 1; scales 40 to 47 from head to caudal base; tubes 38 to 42 in lateral line; 8 or 9 scales above lateral line, 17 or 18 below; snout 3 to 3 1/5 in head; eye 2 7/8 to 3 1/3; maxillary 3 4/5 to 4 1/2; interorbital 3 to 3 1/2; head width 2 to 2 1/2. Gill rakers 5+17, slender, weak, lanceolate, 1/4 of gill filaments, which 1 2/5 in eye. Scales with 11 to 23 basal radiating striae; apical denticles 50 to 112, basal elements in 3 to 11 transverse series; circuli very fine.

Dull brown generally. Each scale on trunk with pale green round spot, forming inclined courses, due to scale rows. On dorsal and anal bases spots brown, smaller and less numerous than on trunk, also not 1 to a scale. Blackish-brown band, nearly wide as eye, from spinous dorsal origin till down below eye, where narrowing but not joining its fellow on chest, bordered with pale line each side. Dorsals with very narrow whitish edge and narrow dusky submarginal line. Anal with lower edge broadly blackish and pale submarginal bordering line. Fins otherwise all pale. Color-pattern quite constant in young and adult.

In the Academy 8 from Apia, 55 to 110 mm. The National Museum has 4 from the Wilkes Expedition without locality, though likely from Fiji or Samoa?. Also 5 from Apia through the Bureau of Fisheries. In the Bishop Museum 1 from Tahiti, 1 Shortland Island, 2 Rarotonga, 2 Raiatea, 5 Agaña on Guam, 1 Marcus Island, 1 Laysan? also from W. A. Bryan. Largest 118 mm. In the Agassiz Museum 8 from Apia, 1 Society Islands from Andrew Garrett, 1 Ebon Island, Marshall Islands, through Rev. A. A. Strong on April 14, 1877, young specimen from Tangoa on Espiritu Santo Island in the New Hebrides.

Greatly like *Chaetodon miliaris* but with the lower edge of the anal always black.

East Indies, Queensland, Melanesia, Micronesia, Polynesia, Hawaii.

Chaetodon punctato-fasciatus Cuvier.

Chaetodon punctato-fasciatus Cuvier: Hist. nat. Poiss., vol. 7, p. 22, 1831 (no type locality).—Kittlitz: Denkw. Reise Mikronesien, vol. 2, p. 160, 1858 (Ulea).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 369, fig. 162, 1903 (1905) (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 59, Dec. 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 27, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 17, 1925 (Johnston Island).—Fowler: B. P. Bishop Mus., Bull. 38, p. 19, 1927 (Honolulu).

Tetragonoptrus (*Tetragonoptrus*) *punctato-fasciatus* Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).

Chaetodon multicinctus Garrett: California Acad. Sci., Proc., vol. 3, p. 65, 1863 (type loc., Hawaii).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 44, pl. 34, fig. B, 1874 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 472, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 53, 1902 (1904) (Honolulu).

A small species, known by 5 deep brown vertical bands, narrower ocular band, also dark band across caudal peduncle and another transversely on caudal fin. Each scale on pale interspaces with small brown spot.

The Bishop Museum has 4 from Honolulu, largest 118 mm. I found 20 in the Honolulu markets during December, 1922. Three from Johnston Island in 1923. One in the National Museum from Honolulu.

East Indies, Melanesia, Micronesia, Hawaii.

Chaetodon lunula (Lacépède).

Pomacentrus lunula Lacépède: Hist. nat. Poiss., vol. 4, pp. 507, 511, 1802 (no type locality) (on Commerson).

Chaetodon lunula Cuvier: Hist. nat. Poiss., vol. 7, p. 45, pl. 173, 1831 (New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Samoa).—Günther: Mus. Godeffroy; Jour., vols. 2-3, pts. 5-6, p. 42, pl. 33, 1874 (Hawaii).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 372, 1897 (Rotuma).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 100, 1900 (Agaña, Guam).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 489, 1901 (Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 16, 19, 20, 1902 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 473, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 531, 1902 (1904) (Honolulu, Waialua Bay, Hilo, Puako Bay).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 366, pl. 54, fig. 160, 1903 (1905) (Honolulu, Kailua, Hilo, Coconut Island).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 64, 1906 (Raiatea, Rarotonga, Nukuhiva, Makatea, Tahiti).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 355, 1906 (Tahiti).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1390, 1906 (Upolu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 340, 1905 (1906) (Apia; Pago Pago).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 439, 1907 (Hawaiian islands).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 307, 1911 (Makemo, Paumotus; Arhno and Wotje, Marshalls).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 59, Dec. 1922 (Hawaii).—Ahl: Arch. Naturg., vol. 89, p. 114, 1923 (Gilberts; Jaluit).—McCulloch: Australian Mus., Records, vol. 14, no. 1, p. 4, 1923 (New Hebrides).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 11, 27, 33, 1925 (Guam; Honolulu; Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 17, 1925 (Wake Island).—Fowler: op. cit., Bull. 38, p. 19, 1927 (Central Pacific).

Chaetodon lunulatus Quoy and Gaimard: Voyage "Uranie," Zool., p. 381, 1825 (type loc., Hawaiian islands).

Chaetodon biocellatus Cuvier: Hist. nat. Poiss., vol. 7, p. 48, 1831 (type loc., Oualan).—Lesson: Voyage "Coquille," vol. 2, pt. 1, p. 176, 1830 (1831) (Oualan).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 512, 1900 (Hawaii).

Tetragonoptrus (*Chaetodontops*) *fasciatus* (non Forskål) Bleeker: Atlas ichth., vol. 9, p. 41, pl. (12), 374, fig. 2, 1877 (New Guinea).

Chaetodon fasciatus Pellegrin: Hist. Nat. Mus. Paris, Bull. 4, p. 229, 1898 (Saypan, Mariannes).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).

Chaetodon tau-nigrum (non Valenciennes) Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 513, 1900 (Hawaii).

Head 2 7/8; depth 1 1/2 to 1 2/3; D. XII, 21, 1 or 25, 1, sometimes 23, 1; A. III, 18, 1 or 19, 1, sometimes 23, 1; scales 38 to 42 from head to caudal base; tubes 33 to 37 in lateral line; 8 to 10 scales above lateral line, 16 to 18 below; snout 2 3/4 to 3 2/5 in head; eye 3 to 3 4/5; maxillary 3 3/4 to 4; interorbital 2 7/8 to 3 1/4.

Head width 2 in its length. Snout conic, width 1 1/3 in its length. Gill rakers 4+12, lanceolate, short, 1/6 of gill filaments, which 1 3/4 in eye. Scales with 10 basal radiating striae; apical denticles 99 to 117, basal elements in 12 to 28 series; circuli very fine.

Brownish generally, little paler below. Black blotch includes eye, interorbital and cheek, edged with white and space behind on head white. Black band from suprascapula to spinous dorsal base, edged widely whitish. Another dark blotch around front dorsal spines basally on squamation, also widely edged whitish. Dorsals and anals narrowly edged blackish, with submarginal whitish bands. Caudal edged whitish, with narrow blackish submarginal band. Dark line across soft dorsal basally, reflected as black blotch on caudal peduncle, broadly edged white. Pale oblique lines follow courses of body scales.

In young middle of dorsal with large deep brown blotch broadly edged whitish. Also similar blotch on caudal peduncle bordered with whitish in front and behind. Transverse brownish band across caudal near base.

In the Academy 4 Hawaiian specimens, of which 2 from J. K. Townsend, 1 from Oahu through W. H. Jones, and 1 from Apia. The smallest, 35 mm. long, a dried skin from J. K. Townsend, in poor preservation, though the 2 caudal ocelli still distinct. The Bishop Museum has 23 from Honolulu, 1 Moilii on Oahu, 1 Laysan? through W .A. Bryan, 1 Tahiti, 2 Rarotonga, 1 Makatea, 3 Raiatea, 5 Nukuhiva, 1 Shortland Island, 2 Agaña on Guam. Largest 194 mm. One of the Honolulu specimens an abnormality, with caudal fin and caudal peduncle absent, the soft dorsal lobe growing down and forming slight overlap to soft anal. I found 16 specimens, normal, in the Honolulu markets during December, 1922. Three from Wake Island in 1923. In the National Museum 15 Hawaiian, 7 Apia, 1 Makemo, 1 Arhno Atoll, 1 Wotje and 2 from Oahu, the last obtained by the Wilkes Expedition. The Agassiz Museum has 1 Hawaiian, 3 Hilo Bay and 5 Society Islands, all obtained by Andrew Garrett, 10 Ebon Island through Rev. A. A. Strong April 14, 1877, 4 Arhno Atoll, and 1 from Tangoa and Espiritu Sancti Island in the New Hebrides.

Red Sea, Zanzibar, Mauritius, Bourbon, Andamans, East Indies, Queensland, China, Melanesia, Micronesia, Polynesia, Hawaii.

Chaetodon flavirostris Günther.

Chaetodon flavirostris Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 41, pl. 32, fig. A, 1874 (type loc., Vavau, Friendly Islands).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 64, 1906 (Faté, New Hebrides).

Head 2 5/6; depth 1 1/3; D. XII, 26, 1; A. III, 20, 1; scales 40 from head to caudal base; tubes 37 in lateral line to bases of last dorsal rays; 8 scales above lateral line, 19 below; 40 predorsal scales; snout 3 1/8 in head measured from upper jaw tip; eye 3; maxillary 3 3/4; interorbital 3 1/5.

Least depth of caudal peduncle 3 1/8 in total head length. Head well compressed, upper profile concave from snout tip to occiput, where slight convexity; width 2 in its total length. Snout conic, length 1 1/5 in its width. Maxillary reaches half way to eye. Bands of slender brush-like teeth in jaws. Nostrils close together, close before eye, front one pore, hind one slit long as half of pupil. Interorbital broadly convex. Preopercle edge largely smooth, few minute denticles above corner. Gill rakers 4+11 weak points, 1/5 of gill filaments, which 2 1/2 in eye. Scales with 10 or 11 basal radiating striae; apical denticles 88, basal elements in 12 to 14 series. First dorsal spine 3 in total head length; fourth dorsal spine 4 3/5; fifth dorsal ray 1 1/3; third anal spine 1 3/4; sixth anal ray 1 1/2; caudal 1 3/4; pectoral 1 1/8; ventral 1 1/3.

Blackish blotch at occiput less than eye. Broad black band below eye on cheek, not extending across head below. Transverse black band from base of soft dorsal before caudal peduncle to middle of anal base. Ventral black. Edges of soft dorsal and anal blackish. Transverse black line on caudal with pale narrow border in front, rest of fin pale. Pectoral pale brown. Body dark brown generally. Iris pale slaty.

One in the Bishop Museum 86 mm. long from Faté.

Chaetodon reticulatus Cuvier (Pl. XXIV, *B*).

Chaetodon reticulatus Cuvier: Hist. nat. Poiss., vol. 7, p. 24, pl. 171, 1831 (type loc., Tahiti; Ulea).—Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 178, pl. 30, fig. 2, 1831 (Tahiti).—Kittlitz: Denkw. Reise Mikronesien, vol. 2, p. 160, 1858 (Ulea).—Kner: Reise "Novara," Fische, vol. 2, p. 271, 1865 (Tahiti).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Samoa; Viti Islands).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 65, 1906 (Raiatea; Rarotonga).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 342, 1905 (1906) (Apia and Pago Pago).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 355, 1906 (Tahiti).—Ahl: Arch. Naturg., vol. 89, p. 139, 1923 (Samoa; Jaluit).

? *Chaetodon bellicosus* Quoy and Gaimard: Voyage "Uranie," Zool., p. 383, 1825 (type loc., Guam).

Chaetodon superbus (Broussonet) Cuvier: Hist. nat. Poiss., vol. 7, p. 24, 1831 (type loc., Ulea, name in text).

Chaetodon collaris (non Bloch) Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 40, pl. 31, fig. A, 1874 (Paumotu).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 229, 1898 (Saipan, Guam).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 99, 1900 (Guam).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 384, 1923 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 34, 1925 (Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 18, 1925 (Wake Island).

Head 3 1/5; depth 1 1/3; D. XII, 26, 1; A. III, 20, 1; scales 44 from head to caudal base; tubes 42 in lateral line; 10 scales above lateral line, 23 below; snout 3 in head; eye 3 2/3; maxillary 3 3/4; interorbital 2 1/3.

Head width 1 7/8 in its length. Gill rakers 4+16, lanceolate, short, rather firm, 1/5 of gill filaments, which 1 1/4 in eye. Scales with 9 to 11 basal radiating striae; apical denticles 102, basal elements in 6 to 8 series; circuli very fine.

Each scale with round yellowish-white spot, though inconspicuous on hind half of head, front of back, suprascapular region and side of breast, which brown, also same tint on outer portions of dorsals and caudal. Trunk otherwise blackish, likewise caudal peduncle and most of anal. Broad black band from supraoccipital to eye and down across cheek, widening below to include breast, thence down including all of ventral to anal. Band on head bordered widely by yellow, separating conspicuously dark color of muzzle below eye. Soft dorsal with narrow whitish edge and submarginal brownish line. Soft anal with 2 blackish submarginal lines. Caudal

with 2 broader submarginal blackish bands. Pectoral dull uniform brown.

One in the Academy from Apia, 128 mm. The Bishop Museum has 1 from Rarotonga, 1 Raiatea, 4 Guam, and 1 from Honolulu, last obtained by J. W. Thompson November 22, 1922. I found 3 in the Honolulu markets December 20, 1922. Largest 142 mm. One from Wake Island in 1923. In the National Museum 4 from Apia. The Agassiz Museum has an adult from Apia and 1 from the Society or Hawaiian Islands? obtained by Andrew Garrett.

India, East Indies, China, Japan, Micronesia, Polynesia, Hawaii.

Chaetodon melannotus Schneider.

Chaetodon melannotus Schneider: Systema ichth., Bloch, p. 224, 1801 (type loc., Tranquebar).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 13, 1877 (Pelew Islands).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 102, pt. 1, p. 230, 1893 (Fiji).—Weber: Zool. Forsch. Austral. (Semon), vol. 5, p. [104] 264, 1895 (coast of New Guinea).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 341, 1905 (1906) (Apia; Pago Pago).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 123, 1922 (Pago Pago).

Chaetodon melanotus Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 44, 1874 (Samoa; Fiji).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 262, 1883 (southeast New Guinea).—McCulloch: Australian Mus., Records, vol. 14, no. 1, p. 3 (Port Moresby; Duke of York Island; Admiralty Islands; Solomon Islands).—Ahl: Arch. Naturg., vol. 89, p. 128, 1923 (Samoa; Ralum; New Guinea; Bougainville Islands; Palau in Carolines).

Chaetodon dorsalis Günther: Cat. fishes Brit. Mus., vol. 2, p. 28, 1860 (Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Samoa).—Schmeltz: op. cit., Cat. 5, p. 24, 1874 (Samoa; Tonga).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 243, 1882 (New Guinea).

Head 2 1/4 to 2 2/5; depth 1 3/5; D. XII, 20, 1, varies 19, 1; A. III, 18, 1; scales 29 to 38 from head to caudal base; tubes 30 to 32 in lateral line; 8 scales above lateral line, 18 below; snout 3 1/5 to 3 2/3 in head; eye 2 1/2 to 2 2/3; maxillary 3 to 4 1/5; interorbital 2 1/2 to 3 1/3. Head width 1 3/4 to 2 in its length.

Dull brownish generally, scarcely paler below. Dark oblique line, one on each row of body scales. Blackish band, narrow at first, begins close before spinous dorsal origin, passes through eye but little wider than pupil and while not completely joined on lower surface of head, forms large black blotch at front of chest. Broad black expanded band on caudal peduncle, with whitish band adjoining behind.

In the Academy 4 young specimens from Pago Pago, 24 to 26 mm. The National Museum has 4 adults from Apia.

Red Sea, Zanzibar, Mauritius, India, East Indies, China, Queensland, Melanesia, Polynesia.

Chaetodon ocellicauda Cuvier.

Chaetodon ocellicaudus Cuvier: Hist. nat. Poiss., vol. 7, p. 53, 1831 (no type loc., "voyage de Peron").

Chaetodon ocellicauda Ahl: Arch. Naturg., vol. 89, p. 121, 1923 (Matupi?; Ralum; Amboina; New Guinea).

D. XII, 20; A. III, 17; lateral line 35; scales transversely 6 above, 16 below. Snout produced, longer than eye. Dorsal and anal rounded posteriorly. Body with darker streaks descending obliquely forwards. Ocular band much narrower than eye, reaches from dorsal origin across chest. Large black, white-edged spot each side of tail, occupying its whole depth. Dorsal and anal edged white. Caudal with narrow blackish median streak. Ventrals white. (Günther)

Reaches 103 mm., according to Ahl.

Zanzibar, East Indies, Melanesia.

Chaetodon quadrimaculatus Gray (Pl. XXV, *A*).

Chaetodon quadrimaculatus Gray: Zool. miscell., p. 33, 1833 (type loc., Hawaiian islands).—Günther: Cat. fishes Brit. Mus., vol. 2, p. 13, 1860 (type).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 38, pl. 30, fig. A, 1874 (Upolu; Hawaii).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 24, 1874 (Upolu).—Boulenger: Ann. Mag. Nat. Hist. London, 6th. ser., vol. 20, p. 372, 1897 (Rotuma).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 512, 1900 (Hawaii).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 489, 1901 (Honolulu, Laysan).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 16, 1902 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 474, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 531, 1902 (1904) (Honolulu).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 944, 1904 (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 373, pl. 49, 1903 (1905) (Honolulu).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1390, 1906 (Upolu).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 59, December 1922 Honolulu).—Ahl: Arch. Naturg., vol. 89, p. 106, 1923 (Upolu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 28, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 17, 1925 (Johnston and Wake islands).—Fowler: op. cit., Bull. 38, p. 19, 1927 (Honolulu).

Head 3 1/4 to 3 2/5; depth 1 3/5 to 1 2/3; D. XIV, 22, varies 23, 1; A. III, 17, 1, varies 18, 1; scales 38 to 42 from head to caudal base; tubes 36 to 41 in lateral line; 10 to 12 scales above lateral line, 21 or 22 below; snout 2 7/8 to 3 in head; eye 3 2/5 to 3 3/4; maxillary 4 to 4 1/8; interorbital 3 to 3 1/8.

Head width 1 7/8 to 2 in its length. Gill rakers 4+12, short, lanceolate, weak, 1/5 of gill filaments, which 1 2/5 in eye. Scales with 13 to 22 basal radiating striae; apical denticles 67 to 104, basal elements in 4 or 5 series; circuli very fine.

Back deep brown, extending over dorsal bases. White blotch, more than twice size of eye, close above lateral line at its apex, another below dorsal base and before and above its terminus. Lower half of body pale, each scale on side of abdomen with small round brown spot basally. Greater part of caudal peduncle dark brown anteriorly, like back. Pale line from middle of spinous dorsal longitudinally back to last dorsal rays and bordered above by brown line. Similarly on anal pale line bordered below by brown line. Brown band broadly, though not meeting its fellow, from predorsal down to eye and below on head, but not crossing chest; below eye paler and only dark linear borders conspicuous; behind, above pale or whitish area.

In the Academy 1 Hawaiian specimen 148 mm. long, dry skin, from J. K. Townsend, and 1 from Oahu, 115 mm. long, from W. H. Jones. The Bishop Museum has 10 from Honolulu and 1 from Makatea, largest 136 mm. I found 3 in the Honolulu markets in late December, 1922.

Three from Johnston Island and 2 from Wake Island 1923. The National Museum has 4 Hawaiian specimens. In the Agassiz Museum 1 from Honolulu obtained by Andrew Garrett.

This species was named with reference to the

4 large white blotches on the back, 2 on each side.

Polynesia, Hawaii.

Chaetodon selene Bleeker.

Chaetodon selene Bleeker: Nat. Tijds. Ned. Ind., vol. 5, p. 76, 1853 (type loc., Lawajong, Solor).

Tetragonoptrus (Chaetodontops) selene Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

According to Bleeker easily distinguished by the dark semilunar broad band from the base of spinous dorsal along that of soft dorsal, then down across tail and forward along base of soft anal. Narrow dark ocular band from close before dorsal down below chin. Length 160 mm. (Bleeker)

East Indies.

Chaetodon unimaculatus Bloch (Pl. XXV, *B*).

Chaetodon unimaculatus Bloch: Nat. ausländischen Fische, pt. 3, p. 75, pl. 201, fig. 1, 1787 (type loc., East Indies).—Cuvier: Hist. nat. Poiss., vol. 7, p. 55, 1831 (Tahiti).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Samoa).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 37, 1874 (Bonham Island, Tahiti, Samoa).—Schmeltz: op. cit., Cat. 5, p. 24, 1874 (Samoa; Tahiti).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 241, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 263, 1883 (southeast New Guinea).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 512, 1900 (Hawaii).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 16, 19, 21, 1902 (Honolulu).—Snyder: U. S. Fish Comm., Bull., vol. 22, p. 531, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 368, pl. 50, fig. 161, 1903 (1905) (Honolulu; Samoa).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 65, 1906 (Faté).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 342, 1905 (1906) (Apia).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 355, 1906 (Tahiti).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 59, December 1922 (Hawaii).—Ahl: Arch Nat., vol. 89, p. 140, 1923 (Jaluit, Talassia).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 12, 27, 34, 1925 (Guam; Honolulu; Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 17, 1925 (Johnston Island).

Tetragonoptrus (Lepidochaetodon) unimaculatus Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878, (New Guinea).

Chaetodon ocellatus (Parkinson) Cuvier: Hist. nat. Poiss., vol. 7, p. 55, 1831 (type loc., Tahiti [name in text]).

Chaetodon cordiformis Thiollière: Fauna Woodlark, p. 165, 1857 (type loc., Woodlark Island).

Chaetodon sphenospilus Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 395, fig. 8, 1899 (1901) (type loc., Honolulu).—Jenkins: op. cit., vol. 22, p. 473, 1902 (1903) (types).

[*Chaetodon unimaculatus interruptus* Ahl: Arch. Nat., vol. 89, p. 142, pl. 2, fig. 9, 1923 (type loc., Mauritius).]

Chaetodon dahli Ahl: Arch. Nat., vol. 89, p. 143, pl. 1, fig. 3, 1923 (type loc., Ralum, Bismark Archipelago).

Head 2 7/8 to 3 1/2; depth 1 1/3 to 1 2/3; D. XIII, 23, 1 to 24, 1; A. III, 18, 1 to 20, 1; scales 44 to 47 from head to caudal base; tubes 37 to 42 in lateral line; 9 to 11 scales above lateral line, 22 to 25 below; snout 2 3/5 to 3 in head measured from snout tip; eye 2 7/8 to 3 1/2; maxillary 3 1/2 to 3 3/4; interorbital 2 2/3 to 3 1/8.

Head width 1 4/5 to 2 1/8 in its length. Gill rakers 2+14, finely lanceolate, weak, slender, 1/5 of gill filaments, which 1 3/4 in eye. Scales with 10 to 14 basal radiating striae; apical denticles 70 to 80, basal elements in 2 to 7 series; circuli very fine.

Largely pale brown. Some dark brown vertically oblique lines on front of back and sides above, below eye fainter and sloping abruptly backward. Blackish band from dorsal origin nearly wide as eye down across head and over breast to its fellow. Large black blotch, nearly twice eye, at apex of lateral line on back. Hind soft dorsal and anal broadly blackish submarginally, edge very narrowly whitish. These bands reflect as similar colored band across caudal peduncle.

In the Academy 2 Hawaiian from J. K. Townsend and 3 from Apia, 73 to 97 mm The Bishop Museum has 25 from Honolulu and 2 from Faté, largest 158 mm. I found 4 in the Honolulu markets December 20, 1922. Six from Johnston Island in 1923. The National Museum has the type of *Chaetodon sphenospilus,* besides 8 other Hawaiian specimens and 4 from Apia. In the Agassiz Museum 2 from the Society Islands and 2 from Hilo Bay, all obtained by Andrew Garrett.

Though *Chaetodon cordiformis* is said to have 4 anal spines its pattern of coloration is that of the present species.

Possibly the record for *Chaetodon* from Nu Island, New Caledonia, by Jouan (Soc. Cherbourg, Mem., vol. 9, p. 111, 1863) may be this species: Golden yellow, darker above. Black band through eye to throat. Tail yellow, preceded by black blotch, rounded and bordered white, which well defined and of same curvature. Black streak crosses caudal peduncle. Length 150 mm.

Zanzibar, Madagascar, Ceylon, East Indies, Melanesia, Polynesia, Hawaii.

Chaetodon kleinii Bloch.

Chaetodon kleinii Bloch: Nat. ausländischen Fische, pt. 4, p. 7, pl. 218, fig. 2, 1790 (type loc., East Indies).—Günther: Cruise of "Curaçoa" (Brenchley), p. 409, 1873 (Solomons).—Peters: Akad. Wiss. Berlin, Monatsb., p. 832, 1876 (1877) (New Britain).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 13, 1877 (Yap).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 242, 1882 (New Guinea).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 307, 1911 (Jaluit, Marshalls).

Chaetodon kleini Ahl: Arch. Naturg., vol. 89, p. 144, 1923 (Ralum, New Britain).

Tetragonoptrus (Lepidochaetodon) kleini Bleeker: Atlas ichth., vol. 9, p. 45, pl. (11) 375, fig. 3, 1877 (New Guinea).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

Chaetodon virescens Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, pp. 3, 4, 1859, (Doreh, New Guinea).—Bleeker: Nat. Tijds. Ned Ind., vol. 22, p. 99, 1860 (New Guinea).

Head 3 1/3 to 3 4/5; depth 1 2/5 to 1 1/2; D. XIII, 21 or 23; A. III, 19, 1 to 20, 1; tubular scales 32 or 33 in lateral line; scales 30 to 33 in median lateral series from gill opening to caudal base medianly; 7 to 9 scales above lateral line to spinous dorsal origin, 14 below; snout 3 to 3 1/6 in head; eye 2 2/3 to 2 3/4; maxillary 3 2/5 to 4; interorbital 2 3/4 to 3.

Body well compressed, orbicular. Caudal peduncle strongly compressed, least depth 2 7/8 in head. Head width 1 1/2 to 2 in its length. Snout convex, obtuse, length 3/4 to 1 in its width. Eye large, midway in head length; diameter greater than snout, equals interorbital. Mouth small, lower jaw slightly projects. Maxillary reaches about opposite space between front

and hind nostrils. Teeth in narrow brush-like bands in jaws. Front nostril about last third in snout; hind nostril midway between front nostril and eye. Interorbital convexly elevated. Preopercle edge entire. Gill rakers 2+20? on first arch, short, weak, about 1/3 of gill filaments, which half of eye. Scales with 14 to 20 basal radiating striae; apical denticles 134 to 145, transverse basal elements in 6 to 15 series; circuli fine. Thirteenth dorsal spine 1 1/4 to 1 1/3 in head; third anal spine 1 1/4 to 1 1/3; pectoral 1 1/10 to 1 1/5; ventral 1.

Pale brownish generally. Broad deep brown band vertically from occiput through eye down to chest where meeting with its fellow. Broad ill-defined band, narrowing below, from front half of spinous dorsal base. Tail, from opposite bases of soft dorsal and anal, brownish, all obscurely spotted with paler. Vertical fins pale brownish, also pectoral. Ventral blackish, brownish basally. Length 83 to 95 mm. (caudal damaged).

In the Agassiz Museum 2 from Jaluit, Marshall Islands, obtained by the *Albatross*. Also 1 from Ebon Island, 75 mm. long, through Rev. A. A. Strong, April 14, 1877, and 1 from Jaluit, Marshall Islands, 89 mm. A small specimen from Ponapé, Caroline Islands, received through Rev. L. H. Gulick.

The National Museum has 4 adults from Jaluit. In the National Museum, 2 from Samoa, obtained by S. G. Whitmee, 86 and 95 mm. long, and 5 from Jaluit.

Zanzibar, Madagascar, Ceylon, East Indies, Queensland, Melanesia, Micronesia.

Chaetodon auriga Forskål.

Chaetodon auriga Forskål: Descriptiones animalium, pp. XII, 60, 1775 (type loc., Djedda; Lohaja, Red Sea).—Kittlitz: Denkw. Reise Mikronesien, vol. 2, p. 22, fig., 1858 (Ualan).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 241, 1882 (New Guinea).—Waite: Australian Mus., Mem., no. 3, p. 183, 1897 (Funafuti, Ellice Islands).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 492, 1899 (Thornton Island).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 70, p. 488, 1901 (Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 64, 1906 (Tahiti).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 124, 1913 (Sorong, New Guinea).

Tetragonoptrus (*Linophora*) *auriga* Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).

Chaetodon satifer (non Bloch) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 98, 1900 (Guam).

Chaetodon setifer (non Bloch) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 16, 19, 1902 (Honolulu).—Seale: op. cit., vol. 4, no. 1, p. 64, 1906 (Tubuai; Faté; Rarotonga).

Head 3 to 3 1/4; depth 1 4/5; D. XIII, 23, 1; A. III, 20, 1; scales 33 or 34 from head to caudal base; tubes 28 to 30 in lateral line; 8 scales above lateral line, 15 or 16 below; snout 2 1/4 to 2 1/3 in head; eye 3 2/5 to 3 3/4; maxillary 3 2/3 to 3 3/4; interorbital 3 to 3 2/5.

Head width 1 4/5 to 1 7/8 in its length. Dorsal filament extends slightly beyond caudal in smaller specimen. Dried skin dull brown. Dark lines obliquely up above until lowest slopes from pectoral axil, then all slope down toward anal, not following exactly in scale rows. Black blotch, larger than eye, at summit of soft dorsal, fin edge and last membranes of spinous fin marginally blackish. Anal and caudal with submarginal brown lines, latter defining pale brown transverse band. Broad blackish-brown band from supraoccipital to eye, above not wider than pupil and not expanding beyond eye edges until below, where embracing all of cheek, preopercle flange and interopercle, besides meeting its fellow.

In the Academy 3 dry skins from Thornton Island, 150 to 157 mm. These specimens certainly represent *Chaetodon auriga*. Compared with our series of *Chaetodon setifer* the black band on the cheeks is greatly wider, not extending on the preopercle edge to its hind margin on the interopercle. None of my specimens show the black band continuous behind the eye with its upper section as in Günther's figure of *Chaetodon setifer*. Jordan and Seale in their list of fishes of Oceania ignore my record for *Chaetodon auriga* and say the species is "not certainly known from the islands of the Pacific." My specimens were likely collected during the early seventies, or possibly earlier. The Bishop Museum has 28 from Honolulu, 1 Raiatea, 2 Rarotonga, 5 Faté, 1 Tubuai, 3 Agaña on Guam and 1 from Palmyra Island received from C. Montague Cooke, Jr., in 1913. According to the catalogue, the Raiatea specimen is reported by Seale as No. 1564 from "Tahiti," and many of the other specimens are wrongly determined as *Chaetodon setifer*. I found an adult in the Honolulu market November 11, 1922. The largest specimen of the series is 212 mm.

Red Sea, East Indies, Melanesia, Micronesia, Polynesia.

Chaetodon setifer Bloch (Pl. XXVI, *A*).

Chaetodon setifer Bloch: Nat. ausländischen Fische, pt. 7, p. 101, pl. 3, fig. 1, 1793 (no type locality, collection John).—Lesson: Voyage "Coquille," Zool., vol. 1, pt. 2, p. 175, pl. 29, fig. 2, 1830 (Borabora).—Cuvier: Hist. nat. Poiss., vol. 7, p. 58, 1831 (Bolabola).—Thiollière: Fauna Woodlark, p. 163, 1857 (Woodlark Island).—Günther: Cat. fishes Brit. Mus., vol. 2, p. 6, 1860 (Aneiteum).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Samoa).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 36, pl. 26, fig. B, 1874 (Hawaiian islands).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 24, 1874 (Samoa; Tahiti).—Streets: U. S. Nat. Mus., Bull. 7, p. 88, 1877 (Fanning Islands).—Smith and Swain: U. S. Nat. Mus., Proc., p. 137, 1882 (Johnston Island).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 372, 1897 (Rotuma).—Pellegrin: Mus. Hist. Nat., Paris, Bull. 4, p. 229, 1898 (Saypan, Mariannes).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., pp. 512, 528, 1900 (Hawaiian islands, Samoa).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 471, 1902 (1903) (Honolulu).—Snyder: op. cit., p. 531, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 364, pl. 47, 1903 (1905) (Honolulu; Samoa).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1390, 1906 (Upolu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 338, 1905 (1906) (Apia; Pago Pago).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 355, 1906 (Tahiti).—Jordan and Dickerson: op. cit., vol. 34, p. 615, 1908 (Suva, Fiji).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 306, 1911 (Taritari, Gilbert Islands; Makemo, Paumotus; Kusaie, Carolines).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 11, 27, 35, 1925 (Guam; Honolulu; Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 17, 1925

(French Frigates Shoal, Johnston and Wake islands).—McCulloch: Australian Mus., Records, vol. 15, no. 1, p. 35, 1926 (New Hebrides; Solomons; Samoa; Friendly Islands; Funafuti; Papua).—Fowler: B. P. Bishop Mus., Bull. 38, p. 19, 1927 (Palmyra, Fanning, Christmas islands, Honolulu).

Chaetodon auriga setifer Ahl: Arch. Naturg., vol. 89, p. 148, 1923 (Hawaii; Samoa; New Pommerania; Jaluit; Matupi?; New Guinea).

Chaetodon sebanus Cuvier: Hist. nat. Poiss., vol. 7, p. 57, 1831 (type loc., Sea of the Indies; Timor; Guam; Tongatabu; Mauritius; Oualan; Batavia).

Chaetodon nesogallicus Schmeltz: Mus. Godeffroy, Cat. p. 24, 1874 (Viti Islands).

Chaetodon auriga (non Forskål) Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 488, 1900 (Honolulu).

Head 2 7/8 to 3; depth 1 3/5 to 1 3/4; D. XIII, 23, 1, to 26, 1, abnormally XII, 14; A. III, 20, 1 to 22, 1; scales 32 to 34 from head to caudal base; tubes 32 to 35, abnormally 20, in lateral line; 7 or 8 scales above lateral line, 13 to 15 below; snout 2 2/5 to 2 3/5 in head; eye 3 3/4 to 3 7/8; maxillary 3 3/5 to 4; interorbital 3 2/5 to 3 3/5; head width 2 to 2 1/4. Gill rakers 6+12, lanceolate, less than 1/4 of gill filaments, which 1 3/5 in eye. In largest example soft dorsal filament nearly long as head, much shorter in smaller. Color pattern little variable.

The Academy has 4 Hawaiian and 4 Samoan specimens, largest 150 mm. I found 13 in the Honolulu markets during December 1922. In the National Museum 3 without locality, likely from Samoa or Hawaii?, obtained by the Wilkes Expedition. Others chiefly through the Bureau of Fisheries, are 1 from Kusaie, 3 Makemo, 1 Taritari, 8 Apia, 2 Honolulu, 1 Johnston Island, 2 Fanning Islands. The Agassiz Museum has 9 from Hilo, 1 Society Islands and 16 Apiang in the Gilbert Islands through Andrew Garrett. Others 2 from Paanopa in the Gilbert Islands through J. M. Barnard, 11 from Ebon Island, through Rev. A. A. Strong and Rev. B. G. Snow in April 1877 and 2 from Apia.

The Bishop Museum has 1 from French Frigates Shoal, 5 Johnston Island, and 4 Wake Island in 1923.

Jouan describes it from Port de France, New Caledonia as *Chaetodon* No. 29 (Soc. Cherbourg, Mem., vol. 8, p. 257, 1861).

Red Sea, Zanzibar, Mauritius, East Indies, China, Queensland, Melanesia, Micronesia, Polynesia, Hawaii.

Chaetodon vagabundus Linné.

Chaetodon vagabundus Linné: Systema nat., 10th ed., p. 266, 1758 (type loc., Indies).—Cuvier: Hist. nat. Poiss., vol. 7, p. 38, 1831 (Vanicolo; Tahiti).—Lichtenstein: Descriptiones animalium, p. 155, 1844 (tropical Pacific).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Samoa).—Günther: Cruise of "Curaçoa" (Brenchley) p. 409, 1873 (Solomons).—Günther: Mus. Godeffroy, Jour., vols, 2-3, pts. 5-6, p. 43, 1874 (Polynesia).—Günther: Rept. voyage "Challenger," vol. 1, p. 34, 1880 (Ovalau, Fiji).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 242, 1882 (New Guinea).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 528, 1900 (Samoa).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 64, 1906 (Faté; Shortland Island; Raiatea).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1390, 1906 (Upolu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 339, 1905 (1906) (Apia; Pago Pago).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 355, 1904 (Tahiti).—Pellegrin: Mus Nat. Hist., Paris, Bull., vol. 18, p. 206, 1912 (Port Sandwich, New Hebrides).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 124, 1913 (Sorong, New Guinea).—Ahl: Arch. Naturg., vol. 89, p. 153, 1923 (Ralum; New Guinea: Matupi; New Pommerania; Samoa; French Islands).—McCulloch: Australian Mus., Records, vol. 14, no. 1, p. 3, pl. 1, figs. 1-2, 1923 (Solomons; New Hebrides; Fiji; Duke of York Island; Papua).

Tetragonoptrus (*Linophora*) *vagabundus* Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).

Chaetodon speciosus (Parkinson) Cuvier: Hist. nat. Poiss., vol. 7, p. 40, 1831 (type loc., Tahiti).

Head 2 1/3 to 3; depth 1 1/2 to 1 3/5; D. XIII, 25, 1, varies 23, 1 or 24, 1; A. III, 20, 1, varies 19, 1 to 22, 1; scales 33 to 38 from head to caudal base; tubes 33 to 38 in lateral line; 5 to 7 scales above lateral line, 15 or 16 below; snout 2 2/3 to 3 in head; eye 2 1/2 to 3 7/8; maxillary 3 3/4 to 3 7/8; interorbital 3 to 3 7/8.

Head width 2 1/8 to 2 1/5 in its length. Snout conic, width 1 to 1 1/3 in its length. Gill rakers 4+11, lanceolate, short, 1 1/4 of gill filaments, which half of eye. Scales with 10 to 13 radiating basal striae; apical denticles 118 to 126, basal elements in 10 to 18 series; circuli very fine.

Dull brownish, paler below or on lower sides. Upper 7 front oblique lines dull brown and 12 or more at opposite slope same. Black band from predorsal vertically, edged narrowly white, wide as line. Dorsals edged black, on spinous fin only ends of flaps, on soft fin widening behind with median grayish line. Anal and caudal edges narrowly white behind, with submarginal blackish line. Blackish line begins near front of spinous dorsal medianly, extends back over rayed fin where greatly expanded to cross caudal peduncle and reach middle of soft anal. Median black transverse band on caudal expanded medianly. Youngest specimen differs from all adults in median part of blackish submarginal band on soft dorsal greatly expanded, though less than eye. Behind, this band continued down across caudal as dark basal transverse streak.

In the Academy 1 from Samoa through H. C. Caldwell and 6 from Apia through the Bureau of Fisheries, 45 to 124 mm. The Bishop Museum has 1 from Shortland Island, 1 Faté, 3 Raiatea and 1 Marcus Island through W. A. Bryan. Largest 151 mm. In the National Museum 2 from New Guinea and 10 Apia. The Agassiz Museum has 7 from Apia and 5 Society Islands obtained by Andrew Garrett.

Apparently reported from Port-de-France, New Caledonia, by Jouan (Soc. Cherbourg, Mem., vol. 8, p. 260, 1861).

Red Sea, Madagascar, Mauritius, Reunion, India, East Indies, China, Queensland, Melanesia, Polynesia.

Chaetodon rafflesii Bennett.

Chaetodon rafflesii Bennett: Life of Raffles, p. 689, 1830 (type loc., Sumatra).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Pelew Islands; Fiji).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 44, pl. 35, fig. C, 1874 (Pelew Islands; Fiji).—Peters: Akad. Wiss. Berlin, Monatsb., p. 832, 1876 (1877) (New Hannover).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 242, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 263, 1883 (southeast New Guinea).

Chaetodon rafflesi Günther: Rept. voyage "Challenger," vol. 1, p. 34, 1880 (Ovalau, Fiji).—Jordan and Seale: U. S. Bur. Fish., Bull., vol. 25, p. 339, 1905 (1906) (Apia; Pago Pago).—Ahl: Arch. Naturg., vol. 89, p. 158, 1923 (New Pommerania; New Hannover; Pitatuki Buka; Talassia; Ralum; New Guinea; Matupi).

Tetragonoptrus rafflesi Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).

Tetragonoptrus (Linophora) rafflesii Bleeker: Atlas ichth., vol. 9, p. 49, pl. (14) 376, fig. 4, 1877 (Waigiu; New Guinea).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).

Chaetodon princeps Cuvier: Hist. nat. Poiss., vol. 7, p. 25, 1831 (type loc., New Ireland).—Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 177, 1830 (1831) (Port Praslin, New Ireland).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).

Chaetodon sebae Cuvier: Hist. nat., Poiss., vol. 7, p. 40, 1831 (type loc., New Guinea).

D. XIII, 21; A. III, 19; scales 25 in lateral line, 5 above, 13 below. Snout produced, conic, much longer than eye. Preopercle weakly denticulate. Soft dorsal and anal rounded. Black ocular band rather narrower than eye. Dorsal with black margin, edged white on both sides, widening posteriorly. Anal with black submarginal line, edge white. Caudal with black crescent, convexity forward, separated from blackish margin by yellow cross-band. Ventrals white. (Günther)

In the National Museum 4 from Apia.

Confused by Bleeker as *Coradion chrysozonus.* (Atlas ichth., vol. 9, pl. [14] 376, fig. 5, 1877).

East Indies, Melanesia, Micronesia, Polynesia.

Chaetodon mertensii Cuvier.

Chaetodon mertensii Cuvier: Hist. nat. Poiss., vol. 7, p. 36, 1831 (no type locality, Russian Expedition Capt. Lütke).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 13, 1877 (Vavao).

Chaetodon mertensi Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 45, pl. 36, fig. B, 1874 (Paumotu).—Jordan and Seale: (U. S.) Bur. Fish., vol. 25, p. 341, 1905 (1906) (Apia; Pago Pago).

Chaetodon xanthurus Bleeker: Soc. Sci. Ind. Neerl., Act. (Amboina), vol. 2, p. 53, 1857 (type loc., Amboina).—Günther: Cat. fishes Brit. Mus., vol. 2, p. 515, 1860 (Aneiteum).—DeVis: Linn. Soc. New South Wales, Proc., vol. 8, p. 457, 1883 (Api).

Chaetodon dixoni Regan: Ann. Mag. Nat. Hist. London, 7th ser., vol. 13, p. 276, fig. 1904 (type loc., New Hebrides).

Two adults in the National Museum from Apia. The Agassiz Museum has 2 from the Society Islands, 140 and 165 mm., obtained by Andrew Garrett.

Apparently related to *Chaetodon corallicola* though differs in the presence of 4 dark angular crossbands on middle of side, angle at median body axis and directed forward. Broad yellow band on soft dorsal below to soft anal, also yellow transverse band on tail. The figure of *Chaetodon dixoni* Regan differs but little from that of Garrett as reproduced by Günther.

Red Sea, Mauritius, Ceylon, East Indies, Polynesia.

Chaetodon corallicola Snyder.

Chaetodon corallicola Snyder: U. S. Fish Comm., Bull., vol. 22, p. 531, pl. 11, fig. 20, 1902 (1904) (type loc., Oahu Island, in 27 to 29 fathoms).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 374, pl. 46, fig. 1, 1903 (1905) (types).—Fowler: Bishop Mus., Bull. 22, p. 28, 1925 (Honolulu).

Snout black. Broad blackish ocular band rather imperfect. Back with dark blotches. Ventrals dusky terminally. Pectoral and caudal pale, latter with broad dusky border.

A small species with subdued coloration. In the Bishop Museum 5 from Honolulu, 92 to 111 mm. The National Museum has the type of *Chaetodon corallicola* and a paratype, Hawaiian.

Jordan and Seale say this species is an ally of *Chaetodon flavirostris,* though I cannot see that it has much in common. *Tifia* (Jordan) Jordan and Jordan, based on *C. corallicola,* has been proposed chiefly on account of the large scales, a character hardly worthy of distinction even subgenerically.

Chaetodon trichrous Günther.

Chaetodon trichrous Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 40, pl. 36, fig. A, 1874 (type loc., Society Islands).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 355, fig. 2, 1906 (Tahiti).

Head 3; depth 1 3/5; D. XIII, 22, 1; A. III, 18, 1; P. 11, 13; V. I, 5; scales 29 from head to caudal base and 5 more on latter; tubes 35 in lateral line; 7 scales above lateral line, 16 below; 30 predorsal scales; snout 3 1/5 in head; eye 2 1/4; maxillary 3 7/8; interorbital 2 3/4.

Body deeply ovoid, strongly compressed, deepest at pectoral base, predorsal strongly compressed. Caudal peduncle small, well compressed, length 2/5 its width, least depth 3 in head.

Head moderate, profiles alike, flattened sides slightly more approximated above; width 2 1/10 in its length. Snout conic, length slightly less than its width. Eye large, midway in head length. Mouth small, closed jaws even, protractile. Maxillary small, extends half way in snout, expansion 3 1/2 in eye. Teeth fine, brush-like, in narrow band in each jaw. Nostrils close together; front one simple pore about last fourth in snout; hind one oblique slit 3 times as large, close before eye. Interorbital evenly convex. Preopercle edge entire.

Gill opening extends forward opposite eye center. Gill rakers 0+11, short points, 1/6 of gill filaments, which 2 1/5 in eye. Pseudobranchiae long as gill filaments. Isthmus narrowly constricted.

Scales with 12 or 13 basal radiating striae marginally; apical denticles 64 to 70, with 3 or 4 transverse series of basal elements; circuli fine. Scales narrowly imbricated, largest on middle of sides, become gradually smaller posteriorly on body and along upper and lower edges; small scales over soft dorsal and anal, most of caudal basally and on pectoral base. Lateral line of simple well exposed tubes, arched moderately to end below bases of last dorsal rays.

Spinous dorsal origin begins opposite that of pectoral, spines graduated up to fourth which longest, then to last subequal; third spine 1 3/5 in head. Soft dorsal rounded, rays of hind half rapidly graduated to last, which short; sixth ray 1 1/10 in head. First anal spine short; third but slightly longer than second, or 1 3/5 in head. Soft anal like soft dorsal, third ray 1 1/3 in head. Hind caudal edge slightly oblique, with upper rays little longer, expanded fin convex; 1 1/4 in head. Pectoral reaches opposite anal, pointed, upper rays longest; 1 in head. Ventral inserted close behind pectoral base, fin reaches anal; 1 in head. Vent close before anal.

Color in alcohol with head and anterior half of body whitish, trunk with dull golden-yellowish tinge posteriorly. Lips dusky. Broad dusky-brown band begins at

occiput, extends through eye though not quite so wide, down across cheek, side of breast and joins ventral, which black, save narrow white outer edge of spine. Broad diffuse transverse gray-brown band at front of back, another midway in trunk. Dorsals and anals grayish, edges of all narrowly whitish, with narrow submarginal dusky line on each rayed fin. Caudal yellow basally, then whitish and broad terminal third grayish. Pectoral pale brown. Iris, except where crossed by dark transverse band, whitish.

The Bishop Museum has a specimen obtained at Palmyra Island by Messrs. Thurston and Thaanum in May-June 1922, 48 mm. long.

Chaetodon lineolatus Cuvier (Pl. XXVI, *B*).

Chaetodon lineolatus (Quoy and Gaimard) Cuvier: Hist. nat. Poiss., vol. 7, p. 31, 1831 (type loc., Mauritius).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 45, pl. 34, fig. A, 1874 (Paumotus, Society Islands, Samoa, Kingsmills, Hawaiian islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 243, 1882 (New Guinea).—Ramsay and Ogilby: op. cit., 2nd ser., vol. 1, p. 9, 1886 (Port Moresby, New Guinea).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 489, 1901 (Honolulu).—Snyder: U. S. Fish Comm., Bull., vol. 22, p. 531, 1902 (1904) (Honolulu).—Jordan and Evermann; op. cit., vol. 23, pt. 1, p. 365, fig. 159, 1903 (1905) (Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 64, 1906 (Faté).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1390, 1906 (Samoa).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 35, p. 143, 1912 (Rikitea, Mangareva, Paumotus).—Ahl: Arch. Naturg., vol. 89, p. 167, 1923 (New Pommerania; Talassia; New Guinea; New Hannover).—Fowler: B. P. Bishop Mus., Bull. 38, p. 19, 1927 (Honolulu).

Chaetodon lineolatum Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 263, 1883 (southeast New Guinea).

Chaetodon oxycephalus Peters: Akad. Wiss. Berlin, Monatsb., p. 832, 1876 (1877) (New Hannover).

Distinguished by the general whitish color with black vertical band from occiput down over cheek. Also broad black band obliquely along soft dorsal base with blackish lines obliquely forward along rows of scales.

The Bishop Museum has 13 from Honolulu and 1 from Faté, 66 to 248 mm. In the National Museum 2 Hawaiian specimens and 1 from Rikitea. The Agassiz Museum has an adult from the Society Islands, 263 mm. long, obtained by Andrew Garrett.

Seale reports a specimen, No. 1301, Bishop Museum, from Shortland Island as "*Holacanthus lineolatus* Quoy and Gaimard" (B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 65, 1906). I have not located it and conclude it may have been a slip for *Chaetodon lineolatus*.

Red Sea, Zanzibar, Mauritius, East Indies, Queensland, Melanesia, Micronesia, Polynesia, Hawaii.

Chaetodon falcula Bloch.

Chaetodon falcula Bloch: Nat. ausländischen Fische, pt. 7, p. 102, pl. 325, fig. 2, 1793 (no type locality, collection John); op. cit., vol. 9, p. 102, pl. 405, fig. 2, 1795 (no locality).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Samoa).—Schmeltz: op. cit., Cat. 5, p. 24, 1874 (Samoa; Tonga).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 39, pl. 27, fig. C, 1874 (Paumotus, Society Islands, Hervey Islands, Samoa, Kingsmills).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 242, 1882 (New Guinea).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1390, 1906 (Upolu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 18, 1925 (Wake Island).

Chaetodon fulcula Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 101, 1901 (Guam).

Chaetodon ulietensis Cuvier: Hist. nat. Poiss., vol. 7, p. 30, 1831 (type loc., Ulietea).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1860 (Samoa).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 64, 1906 (Raiatea).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 340, 1905 (1906) (Apia; Pago Pago).—Jordan and Snyder: U. S. Nat Mus., Proc., vol. 29, p. 355, 1906 (Tahiti).—Kendall and Goldsborough: Mus. Comp Zool, Mem., vol. 26, p. 307, 1911 (Makemo and Rangiroa, Paumotus).—Ahl: Arch. Naturg., vol. 89, p. 171, 1923 (Jaluit, Samoa).

Chaetodon ulietensis confluens Ahl: Arch. Naturges., vol. 89, p. 172, 1923 (type loc., South Sea).

In the Bishop Museum 3 from Raiatea, and 1 from Agaña on Guam as "Babanoes." Largest 131 mm. Six from Wake Island in 1923. The National Museum has 3 from Apia and 4 from Makemo. The Agassiz Museum has 17 from the Society Islands and 1 young from the Kingsmills?, obtained by Andrew Garrett. An adult from Ebon Island and 2 from Kusaie in the Caroline Islands, through Rev. B. G. Snow, April 15, 1876. Also 2 adults from Rangiroa.

Jordan and Seale say of *Chaetodon ulietensis* "it is well distinguished from the closely related *Chaetodon falcula* of the East Indies, with which Bleeker and Günther have confounded it." While the colored figures of these two authors show great differences, I cannot but think they are conditions of age, that of Bleeker's apparently representing a younger stage. The union of the 2 dark bands across the spinous dorsal does not obtain in my specimens and very likely has been emphasized by Garrett, due possibly to painting from a living fish or one freshly obtained.

Zanzibar, Nicobars, East Indies, Melanesia, Micronesia, Polynesia.

Coradion chrysozonus (Cuvier).

Chaetodon chrysozonus (Kuhl and Van Hasselt) Cuvier: Hist. nat. Poiss., vol. 7, p. 62, 1831 (type loc., Java).

Coradion chrysozonus Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).—Ahl: Arch. Naturg., vol. 89, p. 40, 1923 (Ralum, Bismarck Archipelago).

Chaetodon enneacanthus Cuvier: Hist. nat. Poiss., vol. 7, p. 63, 1831 (no type locality) (name in text).

D. VIII to X, 26 to 30; A. III, 19; scales 45 in lateral line, 10 above, 23 below. Snout blackish; ocular band extends down nearly to ventral base; body with 2 very broad cross-bands; round black spot, edged with white, in middle of soft dorsal. Black band around caudal base. Dorsal and anal with bluish line, parallel to and near margin. Ventral deep black. (Günther)

This species is confused by Bleeker as *Tetragonoptrus* (*Linophora*) *rafflesi* (Atlas ichth., vol. 9, pl. [14] 376, fig. 4, 1877).

East Indies, China.

Parachaetodon ocellatus (Bloch).

Chaetodon ocellatus Bloch: Nat. ausländischen Fische, pt. 3, p. 105, pl. 211, fig. 2, 1787 (type loc., East Indies).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Samoa; Viti Islands).

Parachaetodon ocellatus Bleeker: Atlas ichth., vol. 9, p. 24, pl. (15) 377, fig. 4, 1877 (Waigiu).

Tetragonoptrus oligacanthus Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).

D. VI, 28 to 30; A. III, 19 or 20; scales 55 to 60 in lateral line, 14 above, 21 below. Scales in even longitudinal or horizontal rows. Front dorsal rays over twice height of hind rays. Dark ocular band, narrower than eye, from nape to breast. Large rounded, white-edge black spot before middle of soft dorsal base. Length 145 mm. (Bleeker)

East Indies, Polynesia.

Megaprotodon strigangulus (Gmelin).

Chaetodonton striganguli Gmelin: Systema nat. Linné, p. 1269, 1789 (on Broussonet; plural form).

Chaetodon strigangulus (Solander) Cuvier: Hist. nat. Poiss., vol. 7, p. 32, pl. 172, 1831 (type loc., Tahiti).—Lay and Bennett: Zool. Beechey's Voyage, p. 60, pl. 17, fig. 2, 1839 (Tahiti and Byam Martin Island).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Samoa).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 35, 1874 (Polynesia).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 241, 1882 (New Guinea).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 372, 1897 (Rotuma).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 101, 1906 (Guam).—Ahl: Arch. Naturgesch., vol. 89, p. 179, 1923 (Jaluit; Samoa; South Sea).

Megaprotodon strigangulus Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).

Chaetodon trifascialis Quoy and Gaimard: Voyage "Uranie," Zool., p. 379, pl. 62, fig. 5, 1825 (type loc., Guam).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 14, 1869 (Samoa).

Megaprotodon trifascialis Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 336, pl. 50, fig. 1, 1905 (1906) (Apia; Pago Pago).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 306, 1911 (Fakarava, Paumotus).

Chaetodon bifascialis Cuvier: Regne animal, 2nd ed., vol. 2, p. 190, 1829 (type loc., Guam) (on Quoy and Gaimard's *Chaetodon trifascialis*).

Chaetodon triangulum (Reinwardt) (non Cuvier, 1831, p. 34) Cuvier; Hist. nat. Poiss., vol. 7, p. 32, 1831 (type loc., Moluccas) (name in text).

Chaetodon triangularis Thiollière: Fauna Woodlark, p. 166, 1857 (Woodlark Island).—Kittlitz: Denkw. Reis. Mikronesien, vol. 2, p. 418, 1858 (Aluthy).

Chaetodon allongé (Montrouzier) Thiollière: Fauna Woodlark, p. 166, 1857 (name in synonymy).

Head 3 1/4; depth 1 7/8; D. XIV, 15, 1; A. IV, 15, 1; scales 31 from head to caudal base; tubes 22 in lateral line; 10 scales above lateral line, 17 below; snout 3 1/6 in head; eye 3 2/5; maxillary 4 1/8; interorbital 2 3/5.

Head width 1 7/8 in its length. Gill rakers 8+19, slender, weak, lanceolate, 1/6 of gill filaments, which 1 1/3 in eye. Scales with 10 to 12 basal radiating striae; apical denticles 102 to 130, basal elements 22 to 24; circuli very fine.

Back olive-brown, paler or light brown below. Two elongate pale brown blotches on back, first little larger and more slender. Each row of scales on back with oblique slaty line to median axis, below which in front part of body line turns back, also on each lower row of scales oblique. Broad dusky-brown band nearly wide as eye from each side of supraoccipital and bordered with pale or yellowish, down to its fellow including front of chest. Caudal blackish-brown, hind edge white, with submarginal dusky line and broad creamy band. Edges of soft dorsal and anal narrowly whitish with narrow submarginal dusky line. Few dusky dots on ventral rays basally.

In the Academy 1 from Apia 123 mm. Also 2 young from Pago Pago. These show:

Head 2 1/6 to 2 2/5; depth 1 2/3 to 1 7/8; D. XIV, 17, 1; A. IV, 15, 1 or 16, 1; scales 23 from head to caudal base; tubes 21 to 25 in lateral line; 9 scales above lateral line, 10 below; snout 3 in head; eye 2 1/2; maxillary 3 1/4; interorbital 2 2/3; head width 1 4/5. The smaller has *Tholichthys* characters and its preopercular spine developed. The color of the young is, however, quite different from that of the adult. Length 20 to 31 mm.

The Bishop Museum has 2 from Agaña on Guam and 1 from Raiatea. Length 37 to 117 mm. In the National Museum 6 from Apia and 1 young from Fakarava.

Jouan describes it as *Chaetodon* No. 31 from Baie du Sud, New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 259, 1861). He gives: D. XI, 14; A. IV, 13, scales gray green, with black spots placed in regular mosaic. Length 280 mm.

Megaprotodon plebeius (Gmelin).

Chaetodonton plebeji Gmelin: Systema nat., Linné, 13th ed., p. 1269, 1789 (no type locality) (on Broussonet MS.).

Chaetodon plebeius (Broussonet) Cuvier: Hist. nat. Poiss., vol. 7, p. 52, 1831 (type loc., South Sea).

Chaetodon plebejus Günther: Cat. fishes Brit. Mus., vol. 2, p. 5, 1860 (South Sea).—Günther, Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 35, pl. 32, fig. B, 1874 (South Sea).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 24, 1874 (Viti Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 262, 1883, (southeast New Guinea).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 102, pt. 1, p. 227, 1893 (Fiji).—Ahl: Arch. Naturg., vol. 89, p. 54, 1923 (Viti Islands; New Guinea).

Head 3 1/3; depth 1 2/3; D. XIV, 13 to 17; A. III, 15 or 16; scales in lateral line 50, 7 above, 15 below; eye long as snout. Yellow, with black ocular band white edged. Black ocellus with white edge on caudal peduncle. Length 109 mm. (Day)

India, Queensland, Melanesia, Polynesia.

Microcanthus strigatus (Cuvier) (Pl. XXVIII, *A*).

Chaetodon strigatus (Langsdorf) Cuvier: Hist. nat. Poiss., vol. 7, p. 19, pl. 170, 1831 (type loc., Japan).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 47, 1874 (Hawaii).

Microcanthus strigatus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 474, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 532, 1902 (1904) (Honolulu).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 944, 1904 (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, 376, 1903 (1905) (Honolulu).—Fowler: Bishop Mus., Bull. 22, p. 28, 1925 (Honolulu).

Micracanthus strigatus Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 61, Dec. 1922 (Honolulu).

The Bishop Museum has 7 from Honolulu, 1 from Moilii on Oahu and 1 from Laie also on Oahu, obtained by Charles Montague Cooke III, November 18, 1919. Largest specimen 203 mm. I obtained 1 at Waikiki on October 29, 1922 and 5 in the Honolulu markets during Novem-

ber and December 1922. The Agassiz Museum has 3 from Oahu secured by Andrew Garrett. In the National Museum 3 from Oahu obtained by the Wilkes Expedition. Also 2 Hawaiian without donor.

Readily distinguished by its whitish coloration with horizontal blackish bands. Known from the Hawaiian subregion, Philippines, Riukiu, Australia, China, and Japan.

Gonochaetodon baronessa (Cuvier).

Choetodon baronessa Cuvier: Regne animal, 2nd ed., vol. 2, p. 190, 1829 (on Renard, Poiss. Moluques, vol. 1, pl. 43, fig. 218; vol. 2, pl. 230, fig. 98?, 1718).

Chaetodon baronessa Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Kandavu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 243, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 263, 1883 (southeast New Guinea).

Chaetodon triangulum baronessa Ahl: Arch. Naturg., vol. 89, p. 173, 1923 (Ralum; New Guinea; New Pommerania: Bougainville Island).

Tetragonoptrus (*Gonochaetodon*) *triangulum* Bleeker: Atlas ichth., vol. 9, p. 53, pl. (12) 374, fig. 1, 1877 (New Guinea).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

Chaetodon triangulum Ahl: Arch. Naturg., vol. 89, p. 174, pl. 1, fig. 4, 1923.

Gonochaetodon triangulum McCulloch: Australian Mus., Records, vol. 15, no. 1, p. 3, 1926 (Papua; New Hebrides; Solomons; New Britain).

D. XII, 26; A. III, 21; scales 33 in lateral line, 7 above, 20 below. Snout somewhat longer than eye. Preopercle feebly serrate. Soft dorsal and anal very elevated, angle rounded. Ocular band reaches ventrals, another concentric brown band over snout, third across opercle and side of belly. Sides of body with alternating lighter and darker stripes, angularly bent, angle pointing forward. Soft dorsal, anal, caudal and tail between these fins, blackish; fins with narrow lighter margin; whitish line across caudal root and anal base, forming continuation of dorsal margin. (Günther)

Two from New Guinea in the National Museum, 85 and 88 mm. long. The species reaches 120 mm. Reported by Jouan from Port-de-France, New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 257, 1861).

Red Sea, East Indies, Melanesia, Polynesia.

Hemitaurichthys zoster (Bennett) (Pl. XXVII, *A*).

Chaetodon zoster Bennett: Zool. Soc. London, Proc., pt. 1, p. 61, 1831 (type loc., Mauritius).

Chaetodon polylepis Bleeker: Soc. Sci. Ind. Neerl. Act., (Amboina), vol. 2, p. 54, 1857 (type loc., Amboina).

Hemitaurichthys polylepis Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 384, 1923 (Honolulu).—Ahl: Arch. Naturg., vol. 89, p. 37, 1923 (New Guinea).

D. XII, 24; A. III, 19 or 20; scales 60 to 65 in lateral line. Snout slightly produced, pointed, rather shorter than eye. Preopercle denticulate at angle. Dorsal and anal rounded behind. Yellowish-brown on head. Body with 2 very broad oblique yellow bands; anterior triangular, from between third to ninth dorsal spines to scapulary region, tapering to a point; posterior convex, from last 3 or 4 dorsal spines to back of tail, not extending below lateral line. (Günther)

One from Waikiki, through C. H. Edmondson in 1922 is 146 mm. long. In the Bishop Museum 5 from Honolulu, first obtained August 7, 1905.

Very handsome in life, with pale coloration, the golden areas as here described and the intervening darker tints a bluish-gray.

East Indies, Hawaii.

Hemitaurichthys thompsoni Fowler (fig. 48).

Hemitaurichthys thompsoni Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 384, 1923 (type loc., Honolulu).

Uniformly dark and scales 80 in lateral line.

Heniochus varius (Cuvier).

Taurichthys varius Cuvier: Regne animal, 2nd ed., vol. 2, p. 192, 1829 (type loc., East Indies; on Renard.

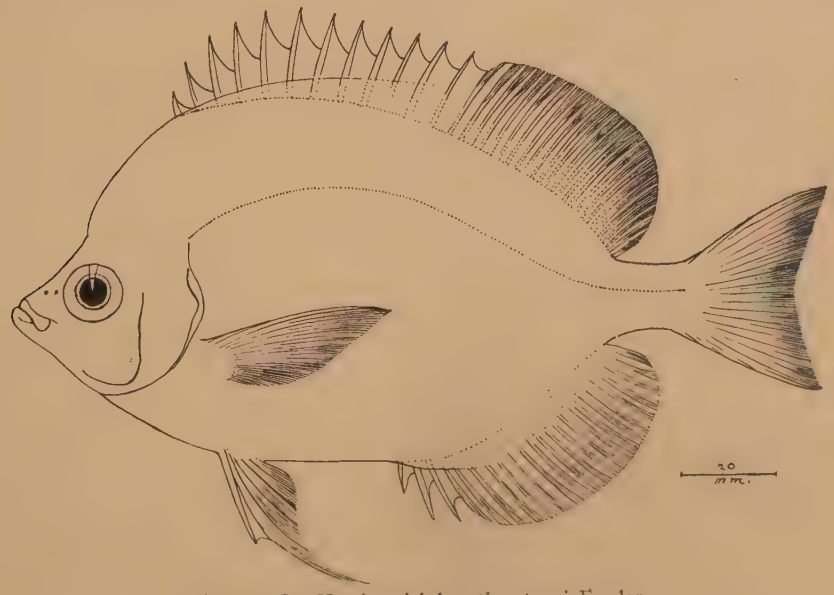

FIGURE 48.—*Hemitaurichthys thompsoni* Fowler.

Poiss. Moluques, vol. 1, pl. 30, fig. 164; vol. 2, pl. 10, fig. 49, 1718).

Heniochus (Taurichthys) varius Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Kandavu).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1391, 1906 (Upolu).

Heniochus varius Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 243, 1882 (New Guinea).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 347, 1905 (1906) (Apia).—Ahl: Arch. Naturg., vol. 89, p. 24, 1923 (New Guinea; Ralum, Bismark Archipelago; Talassia and Tilenius harbor, New Pommerania).

D. XI, 23; A. III, 17; scales 53 in lateral line. Fourth dorsal spine elongate. Protuberance above each orbit, conical and horn-like with age, scarcely visible in young; third, obtusely conical, on nape. Black band from dorsal origin, occupying whole head to preopercular margins; second black band nearly entirely suppressing ground color, from third to seventh dorsal spines to belly, and extends from pectoral and ventral roots to end of anal, which like ventrals entirely black. (Günther)

In the National Museum 2 from New Guinea and 1 from Apia.

East Indies, Philippines, Queensland, Melanesia, Polynesia.

Heniochus permutatus Cuvier.

Heniochus permutatus (Bennett) Cuvier: Hist. nat. Poiss., vol. 7, p. 75, 1830 (no type locality).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 65, 1906 (Raiatea; Faté).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 346, 1905 (1906) (Pago Pago; Apia).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 356, 1906 (Tahiti).

Heniochus chrysostomus Cuvier: Hist. nat. Poiss., vol. 7, p. 75, 1831 (type loc., Tahiti).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p 49, pl. 39, fig. A, 1874 (Paumotu; Society Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 263, 1883 (Hood Bay, New Guinea).—Ahl: Arch Naturg., vol. 89, p. 30, 1923 (Ralum; Tilenius harbor, New Pommerania; New Guinea; Samoa).

Chaetodon chrysostomus (Parkinson) Cuvier: Hist. nat. Poiss., vol. 7, p. 75, 1831 (name in text).

Heniochus chrysostoma Schmeltz: Mus. Godeffroy, Cat. 5, p. 25, 1874 (Samoa; Viti Islands; Apaman Island; Tahiti).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 102, 1900 (Agaña, Guam).

Taurichthys chrysostomus Bleeker: Atlas ichth., vol. 9, p. 29, pl. (4) 366, fig. 2, 1877 (New Guinea).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).

Heniochus drepanoides Thiollière: Fauna Woodlark, p. 166, 1857 (type loc. Woodlark Island).

Drepane cocher (Montrouzier) Thiollière: Fauna Woodlark, p. 166, 1857 (name in synonymy).

Head 2 3/4; depth 1 1/3; D. XII, 22, 1; A. III, 18, 1; scales 44 in lateral line to caudal base; 11 scales above lateral line, 29 below; 25 predorsal scales to occiput and 40 more irregularly forward to snout; snout 3 1/4 in head, measured from its own tip; eye 3; maxillary 5; interorbital 3 2/3. Head width 2 in its total length. Least depth of caudal peduncle 3 1/4 in head. First dorsal spine 5 1/8 in head; third anal spine 1 1/2; caudal 1 1/3; pectoral 1; ventral 1 1/6; fourth dorsal spine 1 7/8 in combined head and trunk.

The Bishop Museum has 1 from Raiatea, 1 Faté and 2 Agaña on Guam, largest 142 mm. In the National Museum 3 from Samoa. The Agassiz Museum has an adult from Hawaii 152 mm. long, 3 from the Society Islands and 1 from the Kingsmills, all obtained by Andrew Garrett. The species has not previously been reported from Hawaii. Jouan mentions it from Port-de-France, New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 258, 1861).

East Indies, Queensland, Melanesia, Micronesia, Polynesia, Hawaii.

Heniochus monoceros Cuvier.

Heniochus monoceros Cuvier: Hist. nat. Poiss., vol. 7, p. 76, 1831 (type loc., Mauritius).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Samoa).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 49, pl. 38, 1874 (Samoa; Tahiti).—Kendall and Radcliffe; Mus. Comp. Zool., Mem., vol. 35, p. 143, 1912 (Rikitea, Mangareva, Gambier Islands, Paumotus).—Ahl: Arch. Naturg., vol. 89, p. 29, 1923 (Samoa).

Loa excelsa Jordan: U. S. Nat. Mus., Proc., vol. 59, 1921, p. 652, fig. 6 (type loc., Hawaii) (Young).

D. XII, 26; A. III, 19; scales 58 in lateral line, 9 above, 24 below. Fourth dorsal spine exceedingly elongate, filiform. Conical protuberance above each orbit, another on nape. Black band from first 2 dorsal spines, occupying all neck, eye, forehead and snout: second band from fifth, sixth and seventh dorsal spines to belly, including roots of paired fins, which deep black; third band from hind dorsal spines, descends obliquely backward and occupying hind half of anal; anterior half black-edged. (Günther)

One in the National Museum from Rikitea, and type of *Loa excelsa*.

Mauritius, East Indies, Polynesia, Hawaii.

Heniochus acuminatus (Linné) (Pl. XXVII, *B*).

Chaetodon acuminatus Linné: Systema nat., 10th ed., p. 272, 1758 (type loc., Indies).

Heniochus acuminatus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 376, pl. 55, 1903 (1905) (Honolulu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 364, 1905 (1906) (Apia).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 125, 1913 (Sorong, New Guinea).—Fowler: B. P. Bishop Mus., Bull. 22, p. 28, 1925 (Honolulu).

Heniochus macrolepidotus Cuvier: Hist. nat. Poiss., vol. 7, p. 70, 1831 (New Guinea).—Bleeker: Act. Soc. Sci. Ind. Neerl., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Samoa; Viti).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 48, pl. 37, 1874 (Polynesia).—Schmeltz: op. cit., Cat. 5, p. 25, 1875 (Apaman Island, Gilberts).—Peters: Akad. Wiss. Berlin, Monatsb., p. 833, 1876 (1877), (New Hannover; New Britain).—Günther: Rept. voyage "Challenger," vol. 1, p. 34, 1880 (Ovalau, Fiji).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 263, 1883 (Hood Bay, New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 20, 21, 1902 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 475, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 532, 1902 (1904) (Honolulu).—Pellegrin: Mus. Hist. Nat. Paris, Bull., 18, p. 206, 1912 (Port Sandwich, New Hebrides).—Jordan and Jordan; Carnegie Mus., Mem., vol. 10, no. 1, p. 61, 1922 (Honolulu).—Ahl, Arch. Naturg., vol. 89, p. 33, 1923 (Ralum; New Guinea; New Britain).

Taurichthys macrolepidotus Bleeker: Atlas ichth., vol. 9, p. 28, pl. (5) 367, fig. 1, 1877 (New Guinea).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).

The Bishop Museum has 10 from Honolulu, the largest 195 mm. In the National Museum

2 from Fiji obtained by the Wilkes Expedition. Also 4 other Hawaiian specimens and 1 from Apia. In the Agassiz Museum 3 from the Kingsmills and 1 from Ebon Island through Rev. B. G. Snow in April 1877. Bleeker had specimens only 35 to 38 mm. long and mentions the *Tholichthys* stage. He says the prolongation of the fourth dorsal spine is seen to be not longer than the head, but that it increases with age.

Red Sea, Zanzibar, Mozambique, Natal, Mauritius, Reunion, Seychelles, Ceylon, India, East Indies, China, Japan, Queensland, Melanesia, Micronesia, Polynesia, Hawaii.

Chelmo rostratus (Linné).

Chaetodon rostratus Linné: Systema nat., 10th ed., p. 273, 1758 (type loc., East Indies).

Chelmon rostratus Thiollière: Fauna Woodlark, p. 166, 1857 (Woodlark Islands).—Kittlitz: Denkw. Reise Mikronesien, vol. 2, p. 160, 1858 (Ulea).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 125, 1913 (Sorong, New Guinea).—Ahl: Arch. Naturg., vol. 89, p. 12, 1923 (New Guinea).

Chelmo rostratus Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 243, 1882 (New Guinea).

Chelmon lol (Montrouzier) Thiollière: Fauna Woodlark, p. 166, 1857 (name in synonymy).

Greatly suggestive of *Forcipiger longirostris* in the long tubular snout, but with fewer dorsal spines (9 compared with 12 or 13). Its color pattern also greatly different as generally very pale with 5 transverse yellow bands and a blue-black ocellus in fourth band at base of soft dorsal. Reaches 170 mm.

East Africa, Mauritius, India, East Indies, China, North Australia, Melanesia, Micronesia, sometimes entering rivers.

Forcipiger longirostris (Broussonet) (Pl. XXVIII, *B*).

Chaetodon longirostris Broussonet: Descriptiones ichth., no pagination, pl., 1782 (type loc., Pacific Ocean near Society and Hawaiian islands).—Cuvier: Hist. nat. Poiss., vol. 7, p. 67, pl. 175, 1831 (Society and Hawaiian islands).

Chelmo longirostris Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 48, 1874 (Hawaiian islands, Society Islands, Paumotus, Friendly Islands, Kingsmills).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 24, 1874 (Tahiti).

Forcipiger longirostris Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 512, 1900 (Hawaiian islands).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 471, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 531, 1902 (1904) (Honolulu).—Jordan and Evermann, op. cit., vol. 23, pt. 1, p. 363, pl. 46, 1903 (1905) (Apia; Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 64, 1906 (Raiatea).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 336, 1905 (1906) (Pago Pago).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 356, 1906 (Tahiti).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 306, pl. 5, fig. 2, 1911 (Fakarava, Paumotus).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 58, Dec. 1922 (Hawaii).—Ahl: Arch. Naturg., 89, 1923, p. 8 (New Guinea; Matupi; New Britain; Ralum, Bismark Archipelago; Jaluit).—Fowler: B. P. Bishop Mus., Bull. 22, p. 27, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 17, 1925 (Wake Island).—Fowler, op. cit., Bull. 38, p. 19, 1927 (Honolulu).

Chelmo (*Forcipiger*) *longirostris* Steindachner: Akad. Wiss. Wien, Denk., vol. 70, 1901, p. 489 (Honolulu).

Head (including beak) 2 1/3 to 2 2/5; depth 2 1/8 to 2 2/5; D. XII, 23; A. III, 18; scales 73 from head to caudal base and 8 more on latter; tubes 72 to 74 in lateral line; 15 scales above lateral line, 30 to 40 below; snout 1 3/5 to 1 2/3 in head; eye 5 3/4 to 6; maxillary 2 1/3; interorbital 6 1/8.

Gill rakers 5+10, lanceolate, 1/4 of gill filaments, which half of eye. Scales with 11 to 13 basal radiating striae; apical denticles 55 to 60, basal elements in 5 or 6 series; circuli very fine.

Pale brown. Head above deep brown till level with lower eye edge and back to first dorsal spine. Last 7 anal rays with terminal half of fin blackish. Edges of soft dorsal and anal narrowly whitish, with submarginal dusky line.

In the Academy 2 from the Hawaiian islands, obtained by J. K. Townsend, 152 and 163 mm. These are likely now the earliest noticed from Hawaii, except the type described in 1782. Though one has been preserved in alcohol for about 90 years it is still in good condition. The Bishop Museum has 17 specimens from Honolulu and 1 from Raiatea. I have examined 150 specimens in the Honolulu markets during December 1922. Largest 169 mm. Two from Wake Island in 1923. The National Museum has 11 Hawaiian specimens, 1 south of Fakarava and 1 Apia. In the Agassiz Museum 1 from Maui and 1 Society Islands, both through Andrew Garrett.

East Africa, Mauritius, India, East Indies, Queensland, Melanesia, Polynesia, Micronesia, Hawaii.

Holacanthus diacanthus (Boddaert).

Chaetodon diacanthus Boddaert: Epist. Chaet. Diac., p. 19, 1772 (type loc., Amboina; Moluccas).

Holacanthus diacanthus Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Samoa).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 50, pl. 40, fig. B, 1874 (Samoa, Society Islands, Paumotus).—Bleeker: Atlas ichth., vol. 9, p. 65, pl. (6) 368, fig. 5, 1877 (New Guinea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 263, 1883 (South Cape, New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 66, 1906 (Raiatea).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 347, 1905 (1906) (Apia; Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 22, p. 34, 1925 (Samoa).

Centropyge diacantha Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 64, Dec. 1922 (Samoa).

Holacanthus dux Cuvier: Hist. nat. Poiss., vol. 7, p. 138, 1831 (Doreh Harbor, New Guinea).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).

Holacanthus chrysurus Cuvier: Hist. nat. Poiss., vol. 7, p. 141, 1831 (type loc., Dorey Harbor, New Guinea).

Holacanthus bispinosus (non Günther) Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 378, 1903 (1905) (Samoa).

Head 3 1/3 to 3 1/2; depth 2; D. XIV, 18, 1; A. III, 18, 1; scales 68 from head to caudal base; tubes 36 in lateral line; 8 scales above lateral line, 22 below; snout 2 2/5 to 2 3/5 in head; eye 4 to 4 1/10; maxillary 3 3/5; interorbital 3 2/5 to 3 2/3.

Least depth of caudal peduncle 2 7/8 in head. Head width 1 3/5 to 2 in its length. Gill rakers 5+13, compressed, firm, cuneate, 1/5 of gill filaments, which 1 1/2 in eye. Scales with 4 or 5 basal striae, mostly marginal;

apical denticles form long spines, 51 to 56; circuli extremely fine. First dorsal spine 4 1/3 in total head length; last dorsal spine 2; eleventh dorsal ray 1 1/3; third anal spine 2 1/6; ninth anal ray 1 1/3; caudal 1 2/5; pectoral 1 1/4; ventral 1.

Largely dull brownish. Bluish line from dorsal origin to hind eye edge. Another from supraoccipital to eye and median one on interorbital and snout. All with dusky-brown edges. Blue line behind preopercle edge and along hind opercle edge. Preopercle spine bluish. Trunk with 9 pairs of convexly oblique blackish lines sloping backward, extend on dorsals above and reflected on anal as 8 narrow slaty bands, dark edged and about equally wide. Soft dorsal blackish. Other fins pale.

In the Bishop Museum 1 from Raiatea, 152 mm. The Academy has 1 from Pago Pago, 200 mm. In the National Museum 4 from Samoa and 2 Pago Pago. The Agassiz Museum has 1 from Pago Pago 172 mm., 2 Ebon Island, obtained by Rev. B. G. Snow in 1877 and 1 Society Islands through Andrew Garrett.

Red Sea, Zanzibar, Mauritius, East Indies, Melanesia, Micronesia, Polynesia.

Holacanthus arcuatus Gray (Pl. XXVIII, *C*).

Holacanthus arcuatus Gray: Zool. miscell., p. 33, 1831 (type loc., Hawaiian islands).—Gray: Animal kingdom, Griffiths, vol. 10, p. 325, pl. 18, 1834.—Günther: Cat. fishes Brit. Mus., vol. 2, p. 43, 1860 (type).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 50, pl. 32, fig. C, 1874 (type).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 386, 1923 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 34, 1925 (Honolulu).

Chaetodontoplus arcuatus Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., 4th ser., vol. 16, p. 675 (Honolulu, "very rare").

General color pale or whitish, with broad blackish-brown band from behind eye to last dorsal rays, hind border of caudal and lower anal border same.

In the Bishop Museum 4 from Honolulu, largest 177 mm. This species was first obtained in this series January 27, 1904, by J. W. Thompson. Subsequently many others have been noticed.

Holacanthus xanthometopon Bleeker.

Holacanthus xanthometopon Bleeker: Nat. Tijds. Ned. Ind., vol. 4, p. 258, 1853 (type loc., Telokbetong, Sumatra).—Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).—Bleeker: Atlas ichth., vol. 9, p. 64, pl. (9) 371, fig. 2, 1877 (Waigiu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 244, 1882 (New Guinea).

Each scale with blue spot. Head mottled blue and yellowish, with broad yellow band connecting eyes. Last dorsal rays with large dark ocellus. Reaches 240 mm.

East Indies, Andamans.

Holacanthus navarchus Cuvier.

Holacanthus navarchus Cuvier: Hist. nat. Poiss., vol. 7, p. 128, 1830 (type loc., Java).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 263, 1883 (South Cape, New Guinea).

Largely yellowish. Broad blackish-brown wedge from nostrils until along front of spinous dorsal base, then narrowing down and back to include pectoral base and middle of post-ventral region. Another broad blackish-brown band from last half of soft dorsal base across tail and front of caudal peduncle to embrace most of anal posteriorly. Length 195 mm. (Bleeker)

East Indies.

Holacanthus sexstriatus Cuvier.

Holacanthus sexstriatus (Kuhl and Van Hasselt) Cuvier: Hist. nat. Poiss., vol. 7, p. 145, 1831 (type loc., Java).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 244, 1882 (New Guinea).

Each scale of trunk and tail with deep blue spot. Soft vertical fins with light blue crowded spots, fewer or scattered ones on side of head and chest. Pale or white band from close before dorsal obliquely down on preopercle to spine. Trunk and tail with 6 dark brown bands transversely and arched little forward at median axis. Length 385 mm. (Bleeker)

East Indies.

Holacanthus lamarck Lacépède.

Holacanthus lamarck Lacépède: Hist. nat. Poiss., vol. 4, pp. 526, 530, 1802 (no type loc.; "The Dutch collection").

Holacanthus lamarcki Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

Grayish generally, little paler below. Four median longitudinal or horizontal narrow bands of gray-brown. Upper edges of dorsals broadly dark. Ventrals dark reddish. Length 240 mm. (Bleeker)

East Indies.

Holacanthus bispinosus Günther.

Holacanthus bispinosus Günther: Cat. fishes Brit. Mus., vol. 2, pp. 48, 516, 1860 (type loc., Amboina; Aneiteum).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 51, pl. 56, fig. C, 1874 (Tahiti; New Hebrides; Hawaiian islands).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 378, pl. 56, 1903 (1905) (Samoa).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 348, 1905 (1906) (Pago Pago).

Centropyge tutuilae Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 62, pl. 3, fig. 2, Dec. 1922 (type loc., Tuituila, Samoa).

I have no specimens of this species for study. The Pago Pago specimens listed by Jordan and Seale were not located in the National Museum. There is no valid excuse for *Centropyge tutuilae* Jordan and Jordan and its structural characters are certainly not different from those of the present species. The only excuse for *Holacanthus potteri* is its more barred color-pattern. Both are small species and handsomely colored.

Holacanthus potteri Jordan and Metz (Pl. XXIX, *A*).

Holacanthus potteri Jordan and Metz: U. S. Nat. Mus., Proc., vol. 42, p. 524, pl. 71, fig. 1, 1912 (type loc., Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 28, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 18, 1925 (French Frigates Shoal).—Fowler: op. cit., Bull. 38, p. 19, 1927 (Honolulu).

Centropyge potteri Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 62, pl. 3, fig. 1, 1922 (Honolulu).

In the Bishop Museum 2 from Honolulu, 83 and 100 mm. and 1 from Waikiki in 1922 through C. H. Edmonson. One from French Frigates Shoal in 1923. The Agassiz Museum has 1 from Hilo Bay, Hawaii, obtained by Andrew Garrett. Length 70 mm. (without caudal). This species shows rather large, but fewer preopercle and preorbital serrae than credited.

Garrett's figure of *Holacanthus bispinosus* as

published by Günther would be a greater variant than *Holacanthus potteri* and may have been from Hawaiian material, rather than from Tahiti as suggested by Jordan and Jordan.

Holacanthus fisheri Snyder.

Holacanthus fisheri Snyder: U. S. Fish Comm., Bull., vol. 22, p. 532, pl. 11, fig. 21, 1902 (1904) (type loc., off Diamond Head, Oahu in 27 to 29 fathoms; south of Molokai; between Maui and Lanai; off southern Oahu, in 14 to 43 fathoms).

Reddish-orange, hind 2/3 of body tinged dusky. Black blotch above pectoral. Preopercular spine dark blue. Dorsal and anal like body, former narrowly edged black and with obscure blackish posterior blotch; anal broadly blackish terminally, edge narrowly blue. Caudal lemon yellow medially. Pectorals orange. Ventrals orange, dusky marginally; spine and first ray pearl-blue. Length 70 to 83 mm. (Snyder)

In the National Museum 14 Hawaiian examples, including the type.

Holacanthus bicolor (Bloch).

Chaetodon bicolor Bloch: Nat. ausländischen Fische, pt. 3, p. 94, pl. 206, fig. 1, 1787 (type loc., East Indies; West Indies).

Holacanthus bicolor Bleeker: Act. Soc. Sci. Ind. Neerl., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Samoa).—Günther: Cruise of "Curaçoa" (Brenchley), p. 409, 1873 (Solomons).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 51, pl. 39, fig. B, 1874 (Samoa, Solomons, Hawaiian islands).—Bleeker: Atlas ichth., vol. 9, p. 61, pl. (7) 369, fig. 3, 1877 New Guinea).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 244, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 263, 1883 (D'Entrecastreaux Group, New Guinea).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1391, 1906 (Samoa).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 348, 1905 (1906) (Apia; Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 22, p. 34, 1925 (Samoa).

Holacanthus tenigab Thiollière: Fauna Woodlark, p. 169, 1857 (type loc., Woodlark Island).

Head 3 2/5; depth 1 3/4; D. XV, 15, 1; A. III, 17, 1; scales 46 from head to caudal base; tubes 35 in lateral line; 7 scales above lateral line, 24 below; snout 2 2/3 in head; eye 3 1/2; maxillary 3 2/3; interorbital 3.

Head width 1 1/2 in its length. Gill rakers 4+12, cuneate, compressed, 1/5 of gill filaments, which 1 1/4 in eye. Scales with 7 to 9 basal radiating striae; apical denticles 22 to 26, long basal elements entire; circuli very fine.

Black generally. Broad white band from front of dorsal, leaving black suprascapular band down to include pectorals and ventrals well behind their bases Caudal white. Entire dorsal edge white.

One from Apia in the Academy 110 mm. The National Museum has 2 from New Guinea and 15 from Pago Pago. In the Agassiz Museum 1 from the Kingsmills through Andrew Garrett, 95 mm. long.

East Indies, Melanesia, Micronesia, Polynesia, Hawaii?.

Holacanthus tibicen Cuvier.

Holacanthus tibicen Cuvier: Hist. nat. Poiss., vol. 7, p. 130, 1830 (no type loc., "Museum of the Low Countries").—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

Holacanthus leucopleura Günther: Cat. fishes Brit. Mus., vol. 2, p. 516, 1860 (Aneiteum, New Hebrides).

Largely black. Head brown. Edges of spinous dorsal and lower border of anal and all of paired fins yellow. Large yellow blotch on side of back over end of pectoral. Length 130 mm. (Bleeker)

East Indies, Melanesia.

Holacanthus nox Bleeker.

Holacanthus nox Bleeker: Nat. Tijds. Ned. Ind., vol. 5, p. 338, 1853 (type loc., Amboina).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 244, 1882 (New Guinea).

Uniformly dusky to blackish. Reaches 111 mm. (Bleeker)

East Indies.

Holacanthus vrolikii Bleeker.

Holacanthus vrolikii Bleeker: Nat. Tijds. Ned. Ind., vol. 5, p. 339, 1853 (type loc., Amboina).—Günther: Cruise of "Curaçoa" (Brenchley), p. 409, 1873 (Solomons).

Holacanthus vroliki Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

Head and trunk violet-olive, tail dusky or violet-black. Paired fins olive-golden. Each scale of trunk with gray-blue spot. Length 115 mm. (Bleeker)

Red Sea, East Indies, Melanesia.

Holacanthus trimaculatus Cuvier.

Holacanthus trimaculatus (Lacépède) Cuvier: Hist. nat. Poiss., vol. 7, p. 147, pl. 182, 1831 (type loc., Moluccas).—Bleeker: Soc. Sci. Ind. Neerl. Act., no. 2, vol. 6, p. 2, 1859 (Doreh, New Guinea).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

Yellowish-orange. Small dark ocellus at occiput and another larger just below suprascapula. Lower half of anal dusky-brown, edge of fin narrowly white. Length 165 mm. (Bleeker)

Zanzibar, Reunion, East Indies.

Holacanthus flavissimus Cuvier.

Holacanthus flavissimus Cuvier: Hist. nat. Poiss., vol. 7, p. 148, 1831 (type loc., Uleá).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 52, 1874 (copied).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 65, 1906 (Faté).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, 348, 1905 (1906) (Pago Pago; Apia).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 386, 1923 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 34, 1925 (Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 18, 1925 (Wake Island).

Holacanthus luteolus Cuvier: Hist. nat. Poiss., vol. 7, p. 148, 1831 (type loc., Tahiti).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, pl. 40, fig. B, 1874.

Chaetodon luteolus (Parkinson) Cuvier: Hist. nat. Poiss., vol. 7, p. 148, 1831 (name in synonymy).

Holacanthus cyanotis Günther: Cat. fishes Brit. Mus., vol. 2, p. 517, 1860 (type loc., Aneiteum).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Samoa).—Günther: Mus., Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 52, (non pl. 40, fig. A), 1874 (New Hebrides, Kingsmills, Society Islands, Paumotus, Hervey Islands, Samoa, Fiji).—Günther: Rept. voyage "Challenger," vol. 1, p. 34, 1880 (Kandavu, Fiji).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 372, 1897 (Rotuma).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 103, 1900 (Guam).—Steindachner: Akad. Wiss. Wien, Stiz., vol. 115, pt. 1, p. 1391, 1906 (Upolu).

Holacanthus monophthalmus Kner: Akad. Wiss. Wien, Sitz., vol. 56, p. 714, 1867 (type loc., islands of South Sea or west coast of South America).—Kner: op. cit., vol. 57, pt. 1, p. 308, 1868 (Savay, Samoa).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Samoa).

Holacanthus ocularis Peters: Akad. Wiss. Berlin, Monatsb., p. 147, 1868 (type loc., South Seas).

Holacanthus loriculus (non Günther) Seale: B. P.

Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 65, 1906 (Tahiti).

Head 3 1/4; depth 1 4/5; D. XIV, 15, 1; A. III, 15, 1; scales 46 from head to caudal base; tubes 32? in lateral line; 8 scales above lateral line, 23 below; snout 2 1/2 in head; eye 3 1/2; maxillary 3 5/6; interorbital 3 2/5.

Head width 1 3/5 in its length. Gill rakers 4+14, compressed, rigid, cuneate, 1/5 of gill filaments, which 1 3/4 in eye. Scales with 5 to 10 basal radiating striae; apical denticles 19 to 26, basal elements entire; circuli very fine.

Uniform pale brownish. Narrow dusky rim around orbit. Grayish-blue bar along opercle edge rather wide. Soft dorsal, anal and caudal all very narrowly white edged, with submarginal dusky line. Lips gray-brown and pale brown bar transversely across chin.

One in the Academy from Apia. In the Bishop Museum 1 from Tahiti, 1 Faté, 2 Agaña on Guam and 2 from Oahu? Largest specimen 120 mm. One from Wake Island in 1923. The National Museum has 5 from Samoa. The Agassiz Museum has 2 from the Society Islands obtained by Andrew Garrett.

Holacanthus loriculus Günther.

Holacanthus loriculus Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 53, pl. 40, fig. C, 1874 (type loc., Society Islands).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 18, 1925 (Johnston Island).

Head 3 1/2; depth 1 5/6; D. XIV, 16; A. III, 17; scales 43 between gill opening and caudal base; tubes 36 in lateral line; 3 scales above lateral line, 13 below, 24 predorsal; snout (tip damaged) 3 in head; eye 3; interorbital 3.

Body well compressed, oblong ovate. Caudal peduncle well compressed, least depth 2 in head. Head width 1 3/5 its length. Snout convex over surface, little shorter than wide; front profile abruptly declivous forward. Eye with hind edge midway in head length. Mouth small. Teeth fine, close-set, in narrow brush-like bands in jaws. Nostrils small, close together and close before front median rim of eye. Interorbital convex. Preorbital with 4 or 5 strong spines. Hind preopercle edge with 10 to 13 spines and long one at angle slightly larger than eye; below 3 or 4 more spines. Gill rakers 6+15, compressed, slenderly acuminate, half of gill filaments, which 1 4/5 in eye.

Scales with 6 to 9 basal radiating striae; apical denticles 31 to 43, with long slender rootlet to each, circuli very fine. Third dorsal spine 2 1/4 in head, eighth ray 1; third anal spine 1 3/5, eighth ray 1; caudal 1 1/6, rounded convexly behind; pectoral 1; ventral 3 1/5 in combined head and body.

Pale brown generally. On side 5 vertical blackish bands, first much widest or twice wide as those following. On back above lateral line and on soft dorsal some scattered small blackish spots. Hind half of soft dorsal and anal lobes blackish marginally. Iris slaty.

One from Johnston Island in 1923, 93 mm. It differs slightly from Günther's figure. Especially prominent are the terminal posterior marginal black portions of soft dorsal and anal, not shown by Günther. Likewise the black spots on the soft dorsal and above the lateral line, also the narrow black border to the gill opening above. In my specimen the anal spines are graduted up to the third, which longest.

Holacanthus semicirculatus Lesson.

Holacanthus semicirculatus Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 173, pl. 30, fig. 3, 1830 (type loc., Port Praslin, New Ireland; Offack Bay, Waigiu; Cajeli Bay, Buru).—Cuvier: Hist. nat. Poiss., vol. 7, p. 143, pl. 183, 1831 (Timor, Buru, Waigiu, New Ireland).—Thiollière: Fauna Woodlark, p. 169, 1857 (Woodlark Island).—Günther: Cat. fishes Brit. Mus., vol. 2, p. 53, 1860 (Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Kandavu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 263, 1883 (Engineer Group, New Guinea).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 18, 1885 (Rubi, New Guinea).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 125, 1913 (Saonek, New Guinea)

Acanthochaetodon semicirculatus Bleeker: Atlas ichth., vol. 9, p. 69, pl. (8) 370, fig. 5, 1877 (Waigiu).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

Holacanthus alternans Cuvier: Hist. nat. Poiss., vol. 7, p. 144, 1831 (type loc., Madagascar).—Peters: Akad. Wiss. Berlin, Monatsb., p. 832, 1876 (1877) (New Britain).

Holacanthus iburu (Montrouzier) Thiollière: Fauna Woodlark, p. 169, 1857 (type loc., Woodlark Island; name in synonymy).

Holocanthus nicobariensis (non Schneider) Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, 1905 (1906), p. 349 (Pago Pago).

Deep bluish-black with transverse blue-white lines arched from median axis, alternately broader. Caudal with several white crosslines. In young only broader alternate lines of adult persist. Length 120 mm. (Bleeker)

The specimen from Pago Pago 38 mm. long, reported as *Holocanthus nicobariensis* is *Holocanthus semicirculatus*.

There is little doubt but that *Holacanthus alternans* is a synonym. Described as *Holacanthus* by Jouan (Soc. Cherbourg, Mem., vol. 9, p. 114, 1863) from a specimen obtained at Baie du Sud, New Caledonia: Color blue, with dull white and bluish semicircular lines symmetrical on sides, arched toward tail.

Zanzibar, East Indies, Polynesia.

Holacanthus nicobariensis (Schneider).

Chaetodon nicobarcensis Schneider: Systema ichth., Bloch, p. 219, pl. 50, 1801 (type loc., Nicobars).

Holacanthus nicobariensis Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Samoa).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 54, pl. 41, fig. 3, 1874 (Samoa; Society Islands).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 372, 1897 (Rotuma).—Pellegrin: Mus. Paris, Bull. 4, p. 229, 1898 (Saypan, Rota).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 105, 1900 (Guam).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 615, 1908 (Suva, Fiji).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 123, 1922 Pago Pago).

Acanthochaetodon nicobariensis Bleeker: Atlas ichth., vol. 9, p. 69, pl. (3) 365, fig. 1, 1877 (Waigiu).

Holacanthus bishopi Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 106, 1900 (type loc., Agaña, Guam).

Head 2 3/5; depth 1 2/3; D. XIV, 19, 1; A. III, 20; snout 3 1/5 in head; eye 2 2/5; maxillary 3; interorbital 2 4/5. Generally dark blue-black. Round white deep ellipse at front of caudal peduncle, arc in front from soft dorsal to soft anal. Another forward from front

of spinous dorsal to vent. Vertical white line on head down to hind eye edge, then sloping to ventral origin and another defines lips down to isthmus. Outer half of caudal and edges of dorsals and anals white. Iris slaty. Traces of intermediate narrower pale lines also occur on trunk.

In the Academy 1 from Pago Pago 20 mm. long. The Bishop Museum has the type of *Holacanthus bishopi,* besides another specimen from Agaña on Guam. It was supposed to differ chiefly in the presence of more pale lines, though these simply increase with age. One in the Agassiz Museum from the Society Isalnds, 111 mm. long, obtained by Andrew Garrett.

Easily distinguished from *Holacanthus semicirculatus* by the more circular or concentric bluish lines.

Nicobars, East Indies, Melanesia, Micronesia, Polynesia.

Holacanthus imperator (Bloch).

Chaetodon imperator Bloch: Nat. ausländischen Fische, vol. 3, p. 51, pl. 174, 1787 (type loc., Moluccas; Japan).

Holacanthus imperator Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Kandavu).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 53, pl. 41, fig. A, 1874(Society Islands; Paumotus).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 104, 1900 (Agaña, Guam).—Seale: op. cit., vol. 4, no. 1, p. 65, 1906 (Tahiti).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 356, 1906 (Tahiti).

Acanthochaetodon imperator Bleeker: Atlas ichth., vol. 9, p. 70, pl. (5) 367, fig. 2, pl. (12) 374, fig. 4, 1877 (New Guinea).

Holacanthus marianas Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 140, 1900 (type loc., Agaña, Guam).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 615, fig. 6, 1908 (Suva, Fiji).

Head 3 3/4; depth 1 3/4; D. XIV, 20, 1; A. III, 21, 1; scales about 11 between gill opening and caudal base; tubes in lateral line obsolete; about 50 scales transversely at anal origin; snout 2 1/3 in head measured from its own tip; eye 5 1/4; maxillary 3 1/5; interorbital 2 2/3.

Least depth of caudal peduncle 2 in total head length. Head width 1 2/5 in its length. First dorsal spine 5 2/5 in head; last spine 2 1/8; third anal spine 2 2/5; eight anal ray 1 2/3; caudal 1 2/5; pectoral 1 1/10; ventral 3 in combined head and trunk; dorsal lobe, to bases of rays, 2 2/3.

Generally golden-brown. Broad dusky-brown band connects eyes, narrowing below extends to bluish preopercle spine, also bordered in front and behind with blue. Large dusky-brown blotch includes humeral region, pectoral base and hind opercle edge narrowly, bordered in front blue and yellow behind. Trunk and tail with 27 horizontal yellow lines, upper concentrating on soft dorsal others at caudal base, while lower extend along anal base. Caudal yellow. Soft dorsal and anal with blue edges.

In the Bishop Museum 1 from Tahiti, 300 mm. and 1 from Agaña on Guam, besides type of *Holacanthus marianas.* The last is the young, with the lines broken obliquely below the median. One in the National Museum from Suva through B. G. Corney. An adult in the Agassiz Museum from the Society Islands, obtained by Andrew Garrett.

Red Sea, Zanzibar, Mauritius, Ceylon, East Indies, Micronesia, Polynesia.

ZANCLIDAE

Zanclus canescens (Linné) (Pl. XXIX, *B*).

Chaetodon canescens Linné: Systema nat., 10th ed., p. 272, 1758 (type loc., Indies).

Zanclus canescens Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 102, 1900 (Agaña, Guam).—Seale: op. cit., vol. 1, no. 5, pp. 16, 19, 21, 1902 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 475, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 533, 1902 (1904) (Honolulu; Puako Bay; Laysan).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 382, pl. 57, 1903 (1905) (Hilo; Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 66, 1906 (Faté; Shortland Island; Tahiti; Raiatea).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1391, 1906 (Upolu; Savaii).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 350, 1905 (1906) (Apia; Pago Pago).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 356, 1906 (Tahiti).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 308, 1911 (Jaluit, Marshalls; Funafuti, Ellice Islands).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 12, 28, 34, 1925 (Guam, Honolulu, Samoa).

Zanclus cornutus Cuvier: Hist. nat. Poiss., vol. 7, p. 78, pl. 177, 1831 (Tahiti, Carolines, Hawaiian islands, Tongatabu, Vanicolo).—Thiollière: Fauna Woodlark, p. 167, 1857 (Woodlark Island).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).—Bleeker: Nat. Tijds. Ned Ind., vol. 22, p. 99, 1860 (New Guinea).—Günther: Cat. fishes Brit. Mus., vol. 3, p. 493, 1860 (Hawaiian islands).—Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 18, 1869 (Samoa; Viti Islands).—Günther: Cruise of "Curaçoa" (Brenchley), p. 410, 1873 (Solomons).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 142, pl. 92, 1876 (Hawaii; Samoa).—Bleeker: Atlas ichth., vol. 8, p. 77, pl. (4) 366, figs. 1-2, 1877 (Waigiu; New Guinea).—Bleeker: Arch. Neerl., Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 359, 1882 (New Guinea).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 26, 1885 (Rubi, New Guinea).—Vaillant: Soc. Philom. Paris, Bull., 7th ser., vol. 11, p. 56, 1886-87 (Tahiti).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma).—Pellegrin: Mus. Hist. Nat., Paris, Bull. 4, p. 229, 1898 (Saypan, Mariannes).—Waite: Australian Mus., Mem., no. 3, p. 549, 1899 (Funafuti, Ellice Islands).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 513, 1900 (Hawaiian islands).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 489, 1901 (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 64, 1922 (Hawaii).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 18, 1925 (Johnston Island, French Frigates Shoal, Laysan).

Heniochus cornutus Kittlitz: Denkw. Reise Mikronesen, vol. 2, p. 65, 1858 (Ualan).

Zanclus centrognathos Valenciennes: Hist. nat. Poiss., vol. 7, p. 397, 1831 (type loc., Vanicolo, from dolphin in N. Lat. 1° E. Long. 75° from Paris; Vanicolo).

Heniochus à-cornes (Montrouzier) Thiollière: Fauna Woodlark, p. 167, 1857 (type loc., Woodlark Island, name in synonymy).

Zanclus montrouzieri Thiollière: Fauna Woodlark, p. 168, 1857 (type loc., Woodlark Island).

Zanclus ruthiae Bryan: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 4, p. 22, fig. 2, 1905 (1906) (type loc., Honolulu).

Head 2 2/5 to 2 1/2; depth 1 to 1 1/2; D. II, 45 to 47; A. III, 33 to 35; snout 1 3/5 to 1 4/5 in head; eye

3 7/8 to 4 2/3; maxillary 5 to 6; interorbital 3 3/4 to 4. Gill rakers 8, 1/4 of gill filaments, which 1 1/3 in eye. Supraorbital spines variable, sometimes short or little developed. Color pattern uniform.

In the Academy 9 Hawaiian specimens, through J. K. Townsend and W. H. Jones, and 2 from Pago Pago. Largest 172 mm. The Bishop Museum has 30 Hawaiian specimens, besides the type of *Z. ruthiae,* evidently a uniform colored specimen of *Z. canescens.* Others 1 from Tubuai, 2 Marcus Island, 1 Faté, 3 Raiatea, 1 Tahiti, 1 Shortland Island, 8 Agaña on Guam, 1 Laysan through W. A. Bryan in 1903. Largest 163 mm. I found 91 specimens in the Honolulu markets during December 1922. Eight from Guam, 2 Johnston Island, 2 French Frigates Shoal, and 4 from Laysan in 1923. In the National Museum 1 Hawaiian and 1 Samoan? specimens collected by the Wilkes Expedition. Others mostly through the Bureau of Fisheries, 4 Samoa, 3 Pago Pago, 3 New Guinea, 1 Jaluit, 10 Hawaiian, 1 Laysan. The Agassiz Museum has 2 from Pago Pago, 1 Funafuti, 9 Society Islands, 1 Apiang in the Gilbert Islands, 1 Ebon Island, 1 Fiji, 1 Honolulu, and 7 Hawaiian islands.

Zanzibar, Mauritius, Reunion, India, East Indies, Melanesia, Micronesia, Polynesia, Hawaii.

HEPATIDAE

Günther has described a young specimen of some species of *Hepatus* as *Acronurus brevispinis* (Cat. fishes Brit. Mus., vol. 3, p. 346, 1861), from unknown locality and unidentifiable, as follows: Depth 1 4/5; D. IX, ?; A. III, (2) ?. Mouth cleft somewhat above middle of arch formed by upper and lower snout profiles, immediately below orbit level. Crests on upper side of head serrated. First dorsal spine very short, second stouter but shorter than following. Reddish-white with usual silvery crossband. Length 31 mm.

Another larval form is described by Valenciennes as *Acanthurus orbicularis* (Quoy and Gaimard) Valenciennes (Hist. nat. Poiss., vol. 10, p. 174, 1835, type loc., Guam), condensed as follows:

D. IX, 28; A. III, 27. Orbicular, depth 1 1/4. Eye 3 in head, equals snout. Teeth very small, tridentate. Caudal somewhat truncate. Yellow-ochre. Large black spots irregularly in 2 rows, upper row near dorsal and lower on lateral line. Cranium, eye, cheek, opercle and preventral region golden. Space between pectoral and ventral silvery. Cranium and upper lip with dusky. Fins yellowish, caudal base dusky. Length 50 mm.

Hepatus triostegus (Linné) (Pl. XXXI, *A*).

Chaetodon triostegus Linné: Systema Nat., 10th ed., p. 274, 1758 (type loc., Indies).

Acanthurus triostegus Valenciennes: Hist. nat. Poiss., vol. 10, p. 144, 1835 (Hawaiian islands; Tahiti; Mariannes; Oualan; Society Islands).—Thiollière: Fauna Woodlark, p. 181, 1857 (Woodlark Island).—Bleeker: Soc. Sci Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).—Günther: Cat. fishes Brit. Mus., vol. 3, p. 327, 1861 (Aneiteum, New Hebrides; Hawaiian islands).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 20, 1869 (Samoa; Viti Islands).—Günther: Cruise of the "Curaçoa" (Brenchley), p. 410, 1873 (Solomons).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 108, 1875 (Polynesia; Hawaiian islands).—Peters: Akad. Wiss. Berlin, Monatsb., p. 835, 1876 (1877) (New Hannover).—Streets: U. S. Nat. Mus., Bull. 7, p. 87, 1877 (Fanning Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 4, p. 64, 1879 (Solomons).—Günther: Rept. voyage "Challenger," vol. 1, p. 35, 1880 (Ovalau, Fiji).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 353, 1882 (New Guinea).—Smith and Swain: U. S. Nat. Mus., Proc., p. 138, 1882 (Johnston Island).—Boulenger: Ann. Mag. Nat. Hist. London, 6th. ser., vol. 20, p. 372, 1897 (Rotuma).—Waite: Australian Mus., Mem., no. 3, p. 187, 1897 (Funafuti, Ellice Islands).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 229, 1898 (Marianas).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 49?, 1901 (Honolulu; Laysan).

Teuthis triostegus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 513, 1900 (Oahu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 108, 1900 (Guam).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 325, 1901 (Thornton Island).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 16, 20, 1902 (Honolulu).—Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 134, 1902 (1903) (Marcus Island).—Waite: Australian Mus., Records, vol. 5, p. 3, 1903 (Nauru, Pleasant Island, Marshalls; Paanopa, Ocean Island, Gilberts).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 309, 1911 (Fakarava and Makemo, Paumotus; Jaluit and Arhno Atoll, Marshalls).—Kendall and Radcliffe, op cit., vol. 35, p. 144, 1912 (Mangareva, Gambier Islands).

Hepatus triostegus Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1392, 1906 (Upolu; Savaii).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 66, 1906 (Tahiti; Faté; Rarotonga; Nukuhiva).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 354, 1905 (1906) (Apia).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 616, 1908 (Suva, Fiji).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 124, 1922 (Pago Pago).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 13, 34, 1925 (Guam; Samoa).—Fowler and Bean: Proc. U. S. Nat. Mus., vol. 71, p. 14, 1927 (Tahiti).—Fowler: B. P. Bishop Mus., Bull. 38, p. 20, 1927 (Palmyra, Washington, Fanning, Christmas, Jarvis, Howland and Baker islands).

Harpurus fasciatus (Forster) Schneider: Systema ichth., Bloch, pp. XXXVIII, 215, 1801 (type loc., Huahaine).—Lichtenstein: Descriptiones animalium, p. 216, 1844 (Huahaine).

Axinurus vedar (Montrouzier) Thiollière: Fauna Woodlark, p. 181, 1857 (name in synonymy).

Acanthurus zebra Kittlitz: Denkw. Reise Mikronesien, vol. 2, p. 22, fig., 1858 (Ualan).—DeVis: Linn. Soc. New South Wales, Proc., vol. 8, p. 447, 1883 (Duke of York's Group; as a new species).

Acanthurus triostegus var. *sandvicensis* Streets: U. S. Nat. Mus., Bull., vol. 7, p. 67, 1877 (type loc., Honolulu).

Teuthis sandvicensis Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 479, 1902 (1903) (Honolulu).—Snyder: op. cit., p. 533, 1902 (1904) (Honolulu; Waialua Bay; Hanalei Bay; Puako Bay; Hilo; Necker Island; Laysan).

Acanthurus sandvicensis Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 66, December 1922 (Hawaii).

Hepatus sandvicensis Fowler: B. P. Bishop Mus., Bull. 22, p. 28, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 19, 1925 (Laysan, Lisiansky,

Johnston, Wake, French Frigates Shoal, Lisiansky and Necker islands).

Head 3 2/5 to 3 1/2, young 2 3/5; depth 1 2/3 to 1 7/8, young 1 1/2; D. IX, 23, 1 or 24, 1, varies VIII, 24, 1; A. III, 21, 1, seldom 20, 1; snout 1 2/5 to 1 2/3 in head, young 2; eye 4 to 4 1/8, young 2 2/5; maxillary 4 to 4 1/8; interorbital 2 7/8 to 3, young 2 1/2; head width 1 7/8 to 2, young 2 1/5.

In the Academy 19 Hawaiian specimens of which 2 through J. K. Townsend and the others from Oahu through W. H. Jones. Also 2 from Thornton Island, 23 Apia, 4 Pago Pago. Largest 175 mm. In the National Museum 1 without locality and 1 Hawaiian by the Wilkes Expedition. Others are 168 Hawaiian including a series from Honolulu, of which 2 from W. H. Jones. Also 1 Johnston Island, 1 Necker, 3 Laysan, 1 Fanning, 1 Tahiti, 2 Bougainville Island, 8 Apia, 2 Samoa through Lord Lilford, 1 Jaluit, 1 Arhno, 1 Fakarava, 5 Mangareva. Largest about 180 mm. In the Bishop Museum 12 from Honolulu, 1 Moilii and 3 at Laie on Oahu, 1 Laysan, 5 Faté, 1 Shortland Island, 1 Tubuai, 3 Raiatea, 3 Rarotonga, 7 Makatea, 13 Nukuhiva, 7 Agaña on Guam, 1 Marcus Island, 10 Tahiti. Besides these I found 704 specimens in the Honolulu markets in November and December 1922 and January 1923. Also 3 at Pearl City. Largest 212 mm. Two from Guam in 1923, also several from Laysan, French Frigates Shoal, Lisiansky, Necker, 7 Johnston Island, and 6 Wake Island. In the Agassiz Museum 15 Hawaiian specimens, of which 1 from Andrew Garrett and 6 more from Honolulu through W. H. Jones. Others 4 from Mangareva, 3 Makemo, 18 Apia, 1 Hull's Island, 1 Arhno, 5 Strong's Island in the Caroline Islands through Rev. B. G. Snow, 2 Ponapé, 9 Society Islands through Andrew Garrett, 15 Ascension Island through Rev. A. A. Strong, 1 Ebon Island through Rev. B. G. Snow, 3 Langoa on Espiritu Sancti Bay in the New Hebrides.

Apparently *Acanthurus* No. 35 as mentioned by Jouan (Soc. Cherbourg, Mem., vol. 8, p. 261, 1861) from Port de France, New Caledonia, is this species.

Considerable variation occurs in the color-pattern and the form *sandvicensis* of Streets is variable. Even in Hawaiian specimens I find a few with the second deep brown band not continued below the pectoral base. The last dark band on the caudal peduncle on some is a complete ring, or variously broken below or laterally, appearing on some specimens as simply 2 spots. On others it is faint or nearly absent. On some, a dark spot is present at the last dorsal rays basally; on others, moved forward. Although all the dark vertical bands are present in the larval stage, even before scales form, or when the body is finely keeled vertically, they may not extend on the fin bases. Young Pago Pago specimens show slight color variation, all at least without the second dark vertical band continued below the pectoral base, though on some besides the dark spot on the fin base another below.

A widely distributed and abundant species through the Indo-Pacific. Mauritius, Bourbon, Seychelles, East Indies, Queensland, Melanesia, Micronesia, Polynesia, Hawaii.

Hepatus guttatus (Schneider) (Pl. XXX, *A*).

Acanthurus guttatus Schdeider: Systema ichth., Bloch, p. 215, 1801 (type loc., Tahiti).—Valenciennes: Hist. nat. Poiss., vol. 10, p. 143, 1835 (Tahiti; Friendly Islands).—Günther: Cat. fishes Brit. Mus., vol. 3, p. 329, 1861 (Tahiti; Aneiteum).—Schmeltz; Mus. Godeffroy, Cat. 4, p. 20, 1869 (Samoa).—Schmeltz, op. cit., Cat. 5, p. 30, 1874 (Samoa; Viti Islands; Tahiti).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 109, pl. 69, fig. A, 1875 (New Hebrides; Society Islands; Samoa; Kingsmills; Pelew Islands; Hawaiian islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 353, 1882 (New Guinea).—Waite: Australian Mus., Mem., no. 3, p. 188, 1897 (Funafuti, Ellice Islands).—Seale: B. B. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 18, 1902 (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 66, December 1922 (Hawaii).

Harpurus guttatus (Forster) Schneider: Systema ichth., Bloch, p. 215, 1801 (name in synonymy).—Lichtenstein: Descriptiones animalium, p. 218, 1844 (Tahiti).

Teuthis guttatus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 494, 1899 (Thornton Island).—Fowler: op. cit., p. 513, 1900 (Hawaiian islands).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 479, 1902 (1903) (Honolulu).—Snyder, op. cit., p. 533, 1902 (1904) (Puako Bay).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 944, 1904 (Honolulu).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 310, 1911 (Rangiroa and Fakarava, Paumotus).

Zebrasoma guttatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 110, 1900 (Agaña, Guam).

Hepatus guttatus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 392, fig. 170, 1903 (1905) (Honolulu; Samoa).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 67, 1906 (Tahiti).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 13, 28, 34, 1925 (Guam; Honolulu; Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 19, 1925 (Wake Island).—Fowler: op. cit., Bull. 38, p. 20, 1927 (Washington and Jarvis islands).

Chaetodon stellatus (Broussonet) Valenciennes: Hist. nat. Poiss., vol. 10, p. 143, 1835 (name in text).

Head 3 to 3 1/3; depth 1 1/3 to 1 2/3; D. IX, 27, 1 or 28, 1; A. III, 24, 1 or 25, 1; snout 1 1/3 to 1 2/5 in head; eye 3 3/5 to 4 1/3; maxillary 3 3/5 to 4; interorbital 3 to 3 1/8. Head width 1 5/6 to 1 7/8 in its length. Gill rakers 5+18, lanceolate, weak, slender, 1/6 of gill filaments, which equal eye. Scales with 8 to 21 apical denticles, basal elements in 3 to 5 series; circuli very fine.

Nearly warm sepia-brown, scarcely paler below. Dorsals and anals slightly dusky. Most of pale vertical bands now faded or obliterated in old examples long preserved. From behind second, which begins about third dorsal spine and extends to vent, area all posteriorly, except caudal, covered with crowded small round pale or whitish spots, some with dark edges. Pectoral and ventral dull olive-brown.

The Academy has 1 Hawaiian specimen from J. K. Townsend, 2 Thornton Island and 1 Apia. Largest 205 mm. In the National Museum 4

from Apia, 1 Truk Island in the Caroline Islands, 1 Fakarava and 1 Taritari. The Bishop Museum has 6 from Honolulu, 4 Agaña on Guam, 4 Tahiti, 1 Marcus Island and 1 Palmyra Island through C. Montague Cooke, Jr., in 1913. Largest 290 mm. Also 3 from Wake Island in 1923.

Mauritius, Bourbon, Melanesia, Micronesia, Polynesia, Hawaii.

Hepatus leucopareius (Jenkins) (Pl. XXX, *B*).

Teuthis leucopareius Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 476, fig. 28, 1902 (1903) (type loc., Honolulu).

Hepatus leucopareius Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 386, fig. 167, 1903 (1905) (Honolulu; Hilo; Waikiki).—Jordan and Snyder: (U. S.) Bur. Fish., Bull., vol. 26, p. 217, 1906 (1907) (Waikiki).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 12, 78, 1925 (Guam; Honolulu).

Acanthurus leucopareius Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 65, December 1922 (Honolulu).

Teuthis umbra Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 477, 1902 (1903) (type loc., Honolulu).—Snyder: op. cit., p. 533, 1902 (1904) (Puako Bay, Hawaii).—Jordan and Evermann: op. cit., vol. 23, pt. 1, pl. 47, 1903 (1905).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 144, 1912 (Cook Bay, Easter Island; Hawaii).

Hepatus umbra Jordan and Evermann: U. S. Fish Comm., vol. 23, pt. 1, p. 387, 1903 (1905) (type; Honolulu).

Acanthurus umbra Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 65, December 1922 (Hawaii).

Teuthis bishopi Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 134, 1902[2] (type loc., Marcus Island).

Head 3 to 3 2/3; depth 1 3/5 to 1 7/8; D. IX, 24, 1 or 25, 1; A. III, 23, 1 or 24, 1; scales 135 close along and below course of lateral line to caudal base; snout 1 1/5 to 1 3/4 in head; eye 3 to 5 3/4; maxillary 4 to 5 1/5; interorbital 2 3/4 to 3.

Least depth of caudal peduncle 2 3/5 in head. Head width 1 3/4 to 2 in its length. Gill rakers 5 to 8+13 to 15, short, weak, 1/6 of gill filaments, which 1 1/3 in eye. Scales with apical denticles 7 to 25, basal elements in 4 or 5 series; circuli extremely fine. First dorsal spine 3 1/5 in head; ninth dorsal spine 1 3/4; tenth dorsal ray 1 3/5; third anal spine 2 2/5; third anal ray 1 3/4; caudal 1; pectoral 1; ventral 1 1/6.

Largely uniform snuff-brown, fins terminally scarcely darker. Dusky blotch, about size of pupil, at last dorsal rays. Very pale obscure band, nearly wide as eye, from dorsal origin down bordering hind eye edge and including opercle. Another transversely across caudal base.

One Hawaiian specimen in the Academy obtained by J. K. Townsend. The Bishop Museum has the type of *Teuthis bishopi*, 11 from Honolulu, 1 Moilii on Oahu, 3 Faté, 1 Tubuai. Largest 189 mm. I examined 265 specimens in the Honolulu markets during November and December 1922 and January 1923. Also 4 from Guam in 1923. In the National Museum one without locality, doubtless obtained in Polynesia, 83 mm. long, from the Wilkes Expedition, 2 from Apia through U. S. Bureau of Fisheries. Also type of *Teuthis leucoparcius*, 2 from Puako Bay on Hawaii and 1 from Cook Bay on Easter Island.

Melanesia, Micronesia, Polynesia, Hawaii.

Hepatus fuliginosus (Lesson) (Pl. XXXI, *B*).

Acanthurus fuliginosus Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 149, pl. 27, fig. 2, 1830 (type loc., Oualan; Offack Bay, Waigiu).

Hepatus fuliginosus Fowler: B. P. Bishop Mus., Bull. 22, p. 28, 1925 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 38, p. 19, 1927 (Jarvis, Palmyra and Fanning islands.

Acanthurus matoides Valenciennes: Hist. nat. Poiss., vol. 10, p. 150, 1835 (type loc., Oualan).—Günther: Cat. fishes Brit. Mus., vol. 3, p. 330, 1861 (Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 20, 1869 (Samoa).—Peters: Akad. Wiss. Berlin, Monatsb., p. 835, 1876 (1877) (Bougainville Island; Solomons).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 354, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 266, 1883 (Hood Bay, New Guinea).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 65, December 1922 (Honolulu).

Rhombotides matoides Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).

Teuthis matoides Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 478, 1902 (1903) (Honolulu).

Hepatus matoides Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 352, 1905 (1906) (Apia).—Jordan and Snyder: (U. S.) Bur. Fish., Bull., vol. 26, p. 217, 1906 (1907) (Honolulu).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).

Acanthurus xanthopterus Valenciennes: Hist. nat. Poiss., vol. 10, p. 158, 1835 (type loc., Seychelles).

Teuthis xanthopterus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 477, 1902 (1903) (Honolulu).

Hepatus xanthopterus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 389, 1903 (1905) (Honolulu).

Acanthurus blochi Valenciennes: Hist. nat. Poiss., vol. 10, p. 153, 1835 (on pl. 203 of Bloch).—Streets: U. S. Nat. Mus., Bull. 7, pp. 68, 87, 1877 (Honolulu; Fanning Islands).—Günther: Rept. voyage "Challenger," vol. 1, pp. 35, 56, 59, 1880 (Ovalau, Fiji; Nares Harbor, Admiralty Islands; Honolulu).

Acanthurus blochii Günther: Mus. Godeffroy, Jour., vol. 4, p. 109, pl. 69, fig. B, 1875 (Carolines, Society Islands, Samoa, Pelew Islands, Kingsmills).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 15, 1877 (Tahiti).—Waite: Australian Mus., Mem., no. 3, p. 188, 1897 (Funafuti, Ellice Islands).

Teuthis annularis Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 513, 1900 (Hawaii).

Hepatus annularis Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).

Teuthis mata Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 107, 1900 (Agaña, Guam).

Teuthis guntheri Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 477, fig. 29, 1902 (1903) (type loc., Honolulu).

Hepatus guntheri Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 388, fig. 168, 1903 (1905) (Honolulu; Hilo).

Acanthurus melanurus Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).

Acanthurus bipunctatus Günther: Cat. fishes Brit. Mus., vol. 3, p. 331, 1861 (type loc., China; Fiji).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 15, 1877 (Yap).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 494, 1901 (Honolulu).—Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 133, 1902 (1903) (Marcus Island).

Head 3 2/5 to 3 3/4; depth 2; D. IX, 23, 1 to 25, 1; A. III, 23, 1; snout 1 2/5 in head; eye 3 1/4 to 4; interorbital 3 to 3 1/3. Gill rakers 5+17, short, weak, 1/6 of gill filaments, which equal eye. Scales with apical

[2] Actual date of publication February 26, 1904.

denticles 22 to 35, basal elements in 7 series, circuli extremely fine. Snuff-brown generally, mostly uniform. Blotch of deep brown or nearly warm sepia at bases of last dorsal and anal rays, smaller than eye. Outer dorsal and anal edges slightly dusky.

In the Academy 2 Hawaiian specimens from J. K. Townsend, 143 to 190 mm. One in the National Museum, without locality, likely from Polynesia?, secured by the Wilkes Expedition. Through the Bureau of Fisheries 4 Hawaiian specimens. The Bishop Museum has 5 from Honolulu, 1 Marcus Island, 3 Rarotonga, 5 Agaña on Guam, 1 Tubuai and 1 Moilii on Oahu. I found 4 in the Honolulu markets January 12, 1923.

The species *Acanthurus fuliginosus* as figured by Lesson shows a uniform brown specimen, its depth of body half its length, without any black spots and the caudal well emarginate. Sauvage, who has examined the type of *Acanthurus matoides* Valenciennes, gives (Hist. Madagascar. Poiss., p. 340, 1891) the dorsal with 9 spines and 27 rays, anal with 3 spines and 26 rays, head contained 4 in length to caudal base and depth 2, color blackish-brown, length 150 mm. The type of *Acanthurus xanthopterus* Valenciennes he says has 9 dorsal spines and 26 rays, 3 anal spines and 24 rays, length 218 mm. The type of *Acanthurus blochii* is given with 9 dorsal spines and 26 rays, 3 anal spines and 24 rays, length 225 mm. The type of *Acanthurus lamarrii* Valenciennes with 9 dorsal spines and 25 rays, anal spines 3 and rays 24, length 295 mm. He identifies *Acanthurus blochii* with the same. This species appears to be quite variable in color-pattern in alcoholic preparations. Often the dark longitudinal bands on the soft dorsal and anal may be obsolete and the black spots at the bases of the last dorsal and anal rays may be variably present or absent. I have seen no specimens which would correspond with the slender one described by Jordan and Evermann as *Hepatus elongatus* from Honolulu with depth given as 2 4/5 times in its length to the base of the caudal. *Acanthurus melanurus* Valenciennes (Hist. nat. Poiss., vol. 10, p. 177, 1835, type loc., Pondicherry) and *Acanthurus melas* Valenciennes (op. cit., type loc., Ceylon) according to Day are apparently *Hepatus fuliginosus,* the former only known from young up to 50 mm. long. Klunzinger places the former with *Hepatus nigricans.*

Madagascar, Mauritius, Bourbon, Seychelles, East Indies, Melanesia, Micronesia, Polynesia, Hawaii.

Hepatus nigrofuscus (Forskål).

Chaetodon nigrofuscus (Forskål): Descriptiones animalium, pp. XIII, 64, 1775 (type loc., Djedda, Red Sea).

Hepatus nigrofuscus Fowler: B. P. Bishop Mus., Bull. 38, p. 20, 1927 (Christmas Island).

One in the B. P. Bishop Museum, 288 mm. from Christmas Island, likely this species. The caudal has a pale transverse basal band and the soft dorsal and anal with dark longitudinal bands. In this species head and breast said to be spotted with golden, though this evidently faded in my specimen.

Red Sea, Bourbon, Ceylon, India, East Indies, Polynesia.

Hepatus elongatus (Lacépède).

Chaetodon elongatus Lacépède: Hist. nat. Poiss., vol. 4, pp. 454, 473, pl. 6, fig. 2, 1802 (type loc., "the Great Ocean" [Indo-Pacific]).

Hepatus elongatus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 389, 1903 (1905) (Honolulu; Hookena).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1393, 1906 (Upolu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 66, 1906 (Tubuai; Faté).—Jordan and Seale: (U. S.) Bur. Fish., Bull. 25, p. 352 (1905 (1906) (Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 18, 1925 (Wake Island).

Teuthis elongatus Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 308, 1911 (Truk, Carolines).

Acanthurus elongatus Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 65, Dec. 1922 (Hawaiian islands).

Acanthurus nigroris Valenciennes: Hist. nat. Poiss., vol. 10, p. 152, 1835 (type loc., Hawaiian islands).

Acanthurus nigros Günther: Cat. fishes Brit. Mus., vol. 3, p. 332, 1860 (type loc., Aneiteum, New Hebrides).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 20, 1869 (Samoa).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 110, 1875 (type; Pelew Islands; Tahiti).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 372, 1897 (Rotuma).

Teuthis bipunctatus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 479, 1902 (1903) (Honolulu).

? Hepatus aquilinus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 353, fig. 66, 1905 (1906) (type loc., Apia, Samoa).

A dark brown uniformly colored species, with a black spot posteriorly at bases of last dorsal and anal rays.

In the Bishop Museum 6 from Wake Island. In the National Museum 5 Hawaiian specimens as *Teuthis bipunctatus,* 3 Apia, and 1 Truk, also type of *Hepatus aquilinus.* One in the Agassiz Museum from Truk.

Apparently known only from Oceania.

Hepatus mata (Valenciennes).

Acanthurus mata Valenciennes: Hist. nat. Poiss., vol. 10, p. 148, 1835 (on *Mata* no. 82 Russell, Fishes of Coromandel, vol. 1, p. 64, pl. 82, 1803, type loc., Vizagapatam).

Head 3 3/5 to 3 2/3; depth 2 to 2 1/10; D. IX, 24, 1 or 25, 1; A. III, 23, 1 or 24, 1; snout 1 9/10 in head; eye 3 1/4 to 3 7/8; maxillary 4 to 4 1/3; interorbital 3 to 3 1/10.

Body rather deeply ovate, well compressed. Caudal peduncle compressed, long as deep, least depth 2 9/10 to 3 in head. Head width 2 in its length. Snout compressed, upper profile moderately convex and oblique; width 1 1/2 to 1 2/3 in its length. Eye elevated, front pupil edge nearly midway in head length; diameter 1 7/8 to 2 in snout; diameter 1 1/5 to 1 1/3 in interorbital; short, oblique, shallow preorbital groove 2/3 of eye diameter. Mouth small, lower jaw slightly shorter. Teeth compressed, close-set, each with finely crenulated edges. Nostrils small, above preoral groove, close be-

fore eye, anterior larger. Interorbital convexly elevated. Gill opening 1 2/5 in head. Scales all small, distant, imbedded over most of head; apical denticles 15 to 17, in 5 transverse series; circuli very fine and crowded. Ninth dorsal spine 1 3/4 to 1 7/8 in head; third dorsal ray 1 1/2 to 1 3/5; third anal spine 2 1/4 to 2 1/3; first dorsal ray 1 2/3 to 1 7/8; caudal 2 7/8 to 3 1/4 in combined head and trunk, deeply emarginate; pectoral 3 1/4 to 3 1/2; ventral 1 1/5 to 1 1/3 in head; caudal spine 1 2/5 to 1 1/2 in eye.

Uniform clove-brown, with grayish shades on belly and breast. Hind edge of gill opening narrowly and inconspicuously dusky. Fins all brown, like body, and no spots in axils. Length 155 to 193 mm.

In the Agassiz Museum 2 from the Society Islands, obtained by Andrew Garrett. These agree well with Day's figure of *Acanthurus mata* (Fishes of India, pt. 2, p. 205, pl. 48, fig. 1, 1876) except that the front profile is more convex. The caudal spine is much shorter in this species than in *Hepatus thompsoni,* moreover it does not have a black spot at the base of the pectoral below. The figure of Day is placed with *Chaetodon gahm* Forskål by Klunzinger.

India, Micronesia, Polynesia.

Hepatus thompsoni Fowler (fig. 49).

Hepatus thompsoni Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 386, 1923 (type loc., Honolulu). —Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 19, 1925 (Wake Island).

Valenciennes gives the number of anal rays as a character of distinction.

Hepatus aterrimus (Günther).

Acanthurus aterrimus Günther: Zool. Soc. London, Proc., p. 660, 1871 (type loc., Savay, Samoan Islands). —Günther: Mus. Godeffroy, Jour., vol. 4, p. 114, pl. 77, fig. B, 1875 (type).

Head 3 1/4; depth 1 3/4; D. IX, 30, 1; A. III, 27, 1; snout 1 1/3 in head; eye 3; maxillary 3 7/8; interorbital 3 1/5.

Body deeply ovoid, greatly compressed. Caudal peduncle well compressed, length 3/4 its least depth which 2 4/5 in head. Head width 2 1/5 in its length. Snout compressed, upper profile concave, width 2 1/2 in its length. Eye high, front edge nearly midway in head length; diameter 2 1/4 in snout, equals interorbital; preorbital groove not evident, only as short smooth strip not half of eye in extent and scaleless. Mouth small, mandible shorter. Teeth 8 in each jaw, broad, incisor-like, with crenulated edges. Nostrils together, close before eye above preorbital strip and front one little larger. Interorbital convex. Gill opening 1 1/3 in head. Scales all small, closely pressed; apical denticles 12 to 14, in 2 or 3 transverse series and circuli minute and close. Ninth dorsal spine 1 2/3 in head; fourth dorsal ray 1 1/2; third anal spine 2 1/4; fourth anal ray 1 3/4; ventral 1 1/5; caudal 3 1/2 in combined head and trunk, deeply emarginate; pectoral 3 4/5. Caudal spine 1 1/2 in eye, within rounded scaleless area, most of which anterior, about equals eye-diameter.

Uniform clove-brown. Narrow opercular edge, bar across chin and hind edge of caudal broadly, with whitish. Lips blackish and pale chin far posterior. Fins and iris all dark like body. Length 105 mm.

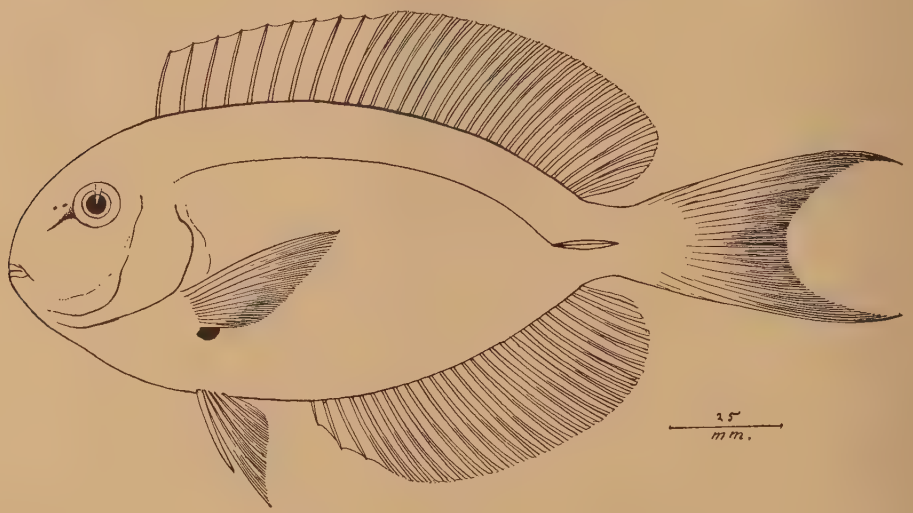

FIGURE 49.—Drawing of *Hepatus thompsoni.*

Differs from *Hepatus mata* in black blotch within lower pectoral base and showing below pectoral fin.

Besides the type 2 from Wake Island in 1923.

Hepatus doreensis (Valenciennes).

Acanthurus doreensis Valenciennes: Hist. nat. Poiss., vol. 10, p. 161, 1835 (type loc., Doreh Harbor, New Guinea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 354, 1882 (New Guinea).

D. IX, 28; A. III, 20. Profile of snout sigmoid. Teeth crenulated. Dorsal and anal form angle, latter more pointed. Caudal points slender, 1/3 length of fin. Brown. Hind caudal edge whitish. Upper part of pectoral yellowish. Length 200 mm. (Valenciennes)

In the Agassiz Museum 1 from the Society Islands, obtained by Andrew Garrett. It agrees with Günther's figure, which, however, does not show the scaleless patch before the caudal spine.

Hepatus maculiceps Ahl.

Hepatus maculiceps Ahl: Mitteil. Zool. Mus. Berlin, vol. 1, pt. 1, p. 36, fig. 4, 1924 (type loc., Talassia, New Pommerania).

Resembles *Hepatus bariene* and *Hepatus nigrofuscus* in the pearl white transverse band on caudal basally. Head spotted finely with deep brown, spots all smaller than eye. Short, black, horizontal bar at shoulder.

Dorsals and anals with dark longitudinal bands. Pectorals pale terminally. Reaches upward of 300 mm.

Hepatus chrysosoma (Bleeker).

Acanthurus chrysosoma Bleeker: Nat. Tijds. Ned. Ind., vol. 13, p. 67, 1857 (type loc., Kajeli).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 20, 1869 (Savay).

Head 4 to 4 1/4 (including caudal fin); depth 2 3/4 to 2 4/5; D. IX, 24 or 25; A. III, 24 or 25; more than 100 scales in lateral series; snout profile convex, length equals eye; eye 2 2/5 in head; preocular groove little conspicuous; 12 teeth in each jaw, wedge-shaped. Caudal spine less than eye. Dorsal and anal obtusely rounded. Caudal truncate. Pectoral 4 1/2 in body; ventral 5 3/5. Golden-yellow, vertical fins edged dusky. Length 43 to 51 mm. (Bleeker)

East Indies, Polynesia.

Hepatus flavoguttatus (Kittlitz).

Acanthurus flavoguttatus Kittlitz: Mus. Senckenberg., vol. 1, p. 195, pl. 13, fig. 5, 1834 (type loc., Caroline Islands).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 112, 1875 (copied).

Acanthurus ketlitzii Valenciennes: Hist. nat. Poiss., vol. 10, p. 162, 1835 (no type locality).

Acanthurus kitlitzii Kittlitz: Denkw. Reise Mikronesien, vol. 2, p. 87, 1858 (Senjawins Island).

Head 3 3/4; depth 2; D. XIII, 14; A. II, 25; snout 1 1/3 in head; eye 4, 3 1/5 in snout. Body ovate-ellipsoid. Caudal spine moderate. Soft dorsal rounded and soft anal little acuminate behind. Caudal deeply emarginate, with long slender points, fin 2 3/4 in combined head and body. Pectoral 1 1/5 in head; ventral 1 1/3. Greenish brown, with yellowish waved lines; 8 shown longitudinally on body, 3 on dorsals, 3 on anals, 3 transversely on caudal. Head and breast spotted with yellowish. Length 127 mm. (Kittlitz)

The original figure shows but 18 soft anal rays. Valenciennes gives D. XII, 18; A. II, 23 and D. XI, 21; A. II, 27 for *Acanthurus ketlitzii*.

Hepatus marginatus (Valenciennes).

Acanthurus marginatus Valenciennes: Hist. nat. Poiss., vol. 10, p. 162, 1835 (no type locality [Carolines]).—Kittlitz: Denkw. Reise Mikronesien, vol. 2, p. 87, 1858 (Senjawins Island).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 111, 1875 (copied).

Acanthurus guttatus (non Schneider) Kittlitz: Mus. Senckenberg., vol. 1, p. 194, pl. 13, fig. 4, 1834 (Luganor, Carolines).

Head 3 2/3; depth 2; D. VIII, 26; A. II, 25; snout 1 1/3 in head; eye 3 7/8 in head, 2 3/5 in snout. Profile of snout concave, muzzle little produced. Soft dorsal and anal with pointed lobes behind. Caudal deeply emarginate, points exserted. Caudal spine moderate. Reddish-brown, scattered blue dots on head and trunk. Vertical fins blackish-brown, dorsal and anal with blue margins. Iris blue, with yellow ring around pupil. Length 114 mm. (Kittlitz)

Hepatus lineatus (Linné).

Chaetodon lineatus Linné: Systema nat., 10th ed., p. 274, 1758 (type loc., Indies).

Acanthurus lineatus Valenciennes: Hist. nat. Poiss., vol. 10, p. 164, 1835 (Waigiu; Oualan).—Thiollière: Fauna Woodlark, p. 179, 1857 (Woodlark Island).—Kittlitz: Denkw. Reise Mikronesien, vol. 2, p. 64, 1858 (Ualan).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).—Kner: Reise "Novara," Fische, vol. 1, p. 210, 1865 (Tahiti).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 20, 1869 (Samoa).—Günther: Cruise of "Curaçoa" (Brenchley), p. 410, 1873 (Solomons).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 111, pl. 70, 1875 (Samoa; Tahiti).—Streets: U. S. Nat. Mus., Bull. 7, p. 100, 1877 (Samoa).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 353, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 266, 1883 (Hood Bay, New Guinea).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 372, 1897 (Rotuma).

Rhombotides lineatus Bleeker: Arch. Neerl. Sci. Nat, vol. 13, p. 38, 1878 (New Guinea).

Teuthis lineatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 100, 1900 (Agaña, Guam).—Waite: Australian Mus., Records, vol. 5, p. 3, 1903 (Nauru, Pleasant Island, Marshalls).

Hepatus lineatus Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, no. 1, p. 1392, 1906 (Upolu; Savaii).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 351, 1905 (1906) (Apia; Pago Pago).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 66, 1906 (Raiatea; Faté; Tahiti).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 356, 1906 (Tahiti).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 12, 34, 1925 (Guam; Samoa).

Acanthurus striatus Quoy and Gaimard: Voyage "Uranie," Zool., p. 373, pl. 63, fig. 3, 1825 (type loc., Marianne Archipelago; Guam).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 20, 1869 (Samoa).—Schmeltz: op. cit., Cat. 5, p. 30, 1874 (Samoa; Tahiti).

Teuthis striatus Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 133, 1902 (1903) (Marcus Island).

Acanthurus barav (Montrouzier) Thiollière: Fauna Woodlark, p. 179, 1857 (name in synonymy).

Head 3 3/4 to 3 7/8, young 2 7/8; depth 2 1/8 to 3, young 2; D. IX, 27, 1 to 29, 1; A. III, 24, 1 to 27, 1; snout 1 2/5 to 2 in head; eye 2 3/4 to 4 1/8; maxillary 3 1/4 to 4 1/4; interorbital 3 to 3 1/5.

Head width 1 3/4 to 2 1/4 in its length. Gill rakers 3 + 9, short, weak, triangular, 1/6 of gill filaments, which equal eye. Scales with 47 to 69 apical denticles, basal elements in 5 to 7 series; circuli extremely fine.

Pale brownish generally. Eleven dusky-brown closely parallel bands, each pair enclosing narrow bluish line. Bands extending over cheek obliquely and more or less broken as several variable similar bands along front, one median and others more or less parallel. Brown band along upper edge of upper lip and down on side, giving off dark horizontal line bounding brown of lower surface. Uppermost bands of trunk extend on soft dorsal, resolving chiefly as longitudinal bluish lines, above which many others parallel. Soft anal brownish, edge narrowly bluish with submarginal dusky line and traces of several horizontal blue lines with dusky borders on last rays. At caudal base 2 vertical bluish lines, bordered dusky, fin dusky basally and terminally brownish, separated by whitish crescent parallel with hind edge. Pectoral pale olive, with 3 parallel horizontally formed blue lines with dark borders basally. Ventral pale brown like breast, with narrow dusky outer edge In most young specimens bands greatly contrast, all about equal in width and slightly more or less inclined.

In the Academy 14 from Apia, 42 to 263 mm. The Bishop Museum has 5 from Tahiti, 3 Faté, 1 Raiatea, 7 Agaña, 1 Nukuhiva, 21 Marcus Island and 1 Palmyra Island in 1922 through Thurston and Thaanum. Largest 271 mm. Also 2 from Guam in 1923. The National Museum has 12 from Apia, 1 Samoa through A. B. Steinberger and 1 from Solomon Islands. In the Agassiz Museum 10 from Apia, 9 Society Islands through Andrew Garrett, and 7 from Ebon Island, Marshall Islands, from Rev. B. G. Snow.

The figure of *Acanthurus striatus* Quoy and Gaimard is crude, though apparently is intended for *Hepatus lineatus*. It differs a little from any of my specimens in eleven slightly inclined pale longitudinal lines on the trunk, these sloping backward and two at least below the pectoral base. Most of my specimens show but one.

Ceylon, East Indies, Philippines, Melanesia, Micronesia, Polynesia.

Hepatus bleekeri (Günther).

Acanthurus bleekeri Günther: Cat. fishes Brit. Mus., vol. 3, p. 335, 1861 (on Bleeker).

Acanthurus mata (non Cuvier) Bleeker: Nat. Tidjs. Ned. Indie, vol. 7, p. 432, 1854 (type loc., Batavia).

Teuthis mata Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, no. 7, p. 310 (Rangiroa and Fakarava).

A rather large species, dark brown, with numerous, narrow, horizontal blue bands or lines, but not on fins.

Described by me as *Harpurus gnophodes* (Acad. Nat. Sci. Philadelphia, Jour., 2nd ser., vol. 12, p. 544, pl. 22, upper fig., 1904, type loc., Padang, Sumatra). The young has also been described as *Acanthurus aurolineatus* Day (Fishes of India, pt. 2, p. 204, pl. 48, fig. 3, 1876, type loc., Waltair, Coromandel Coast). I have examined a specimen in the National Museum from Fakarava.

Red Sea, India, Ceylon, East Indies, Polynesia.

Hepatus bariene (Lesson) (Pl. XXXI, *C*).

Acanthurus bariene Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 150, 1830 (type loc., Offack Bay, Waigiu).

? Acanthurus argenteus Quoy and Gaimard: Voyage "Uranie," Zool., p. 372, pl. 63, fig. 2, 1825 (type loc., Guam [larval]).—Valenciennes: Hist. nat. Poiss., vol. 10, p. 176, 1835 (Hawaiian islands; Mariannes).

Acronurus argenteus Schmeltz: Mus. Godeffroy, Cat. 4, p. 20, 1869 (South Sea).—Schmeltz: op. cit., Cat 5, p. 30, 1874 (Samoa; Tahiti).

Teuthis argenteus Snyder: U. S. Fish Comm., Bull., vol. 22, p. 533, 1902 (1904) (Honolulu).

Acanthurus dussumieri Valenciennes: Hist. nat. Poiss., vol. 10, p. 147, 1835 (type loc., Mauritius).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 112, pl. 72, 1875 (Hawaii).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 266, 1883 (Millfort Harbor, New Guinea).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 490, 1901 (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 65, Dec. 1922 (Hawaii).

Teuthis dussumieri Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 477, 1902 (1903) (Honolulu).

Hepatus dussumieri Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 390, fig. 169, 1903 (1905) (Honolulu; Hilo).—Fowler: B. P. Bishop Mus., Bull. 22, p. 28, 1925 (Honolulu).

Acanthurus nummifer Valenciennes: Hist. nat. Poiss., vol. 10, p. 172, 1835 (type loc., Waigiu [also type of *Acanthurus bariene*]).

Hepatus xanthopterus (part) Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 389, 1903 (1905) (Honolulu).

Head 2 3/4 to 3 7/8; depth 1 1/2 to 2; D. IX, 25, 1 to 27, 1; A. III, 24, 1 to 26, 1; snout 1 1/5 to 2 1/4 in head; eye 2 1/2 to 5; maxillary 2 7/8 to 3 7/8; interorbital 2 3/4 to 3 4/5.

Head width 1 7/8 to 3 in its length. Least depth of caudal peduncle 2 in its length. Gill rakers 5 + 15 to 18, short, lanceolate, 1/6 of gill filaments, which equal eye. Scales with 17 or 18 apical denticles, basal elements in 5 to 7 series; circuli very fine. First dorsal spine 3 3/5 in head; last spine 2; tenth dorsal ray 2; third anal spine 2 1/2; tenth anal ray 1 7/8; caudal, to tips of rudimentary rays, 1 3/5; pectoral 1; ventral 1 1/6.

Nearly bone-brown. Trunk with many fine longitudinal slaty lines, more or less obscure, coarser or more or less broken up or vermiculate in variable courses on head. Pale slaty line usually along dorsal bases. Pectoral tinged olive-brown, other fins more or less dusky. Caudal basally more or less slaty, with many small deep brown spots. Outer portions of dorsals and anal often with several obscure longitudinal pale dusky lines.

In the Academy 7 Hawaiian specimens, 2 of which through J. K. Townsend and 1 from B. Sharp. Largest 235 mm. The National Museum has 2 Hawaiian specimens obtained by the Wilkes Expedition, 43 and 57 mm.; 1 as *Hepatus xanthopterus*. Also 7 others from the same place through the Bureau of Fisheries. In the Bishop Museum 7 from Honolulu, largest 456 mm. One a partial case of icterism, the whole front of the body from the front of spinous dorsal obliquely down to include spinous anal and front of soft anal, yellow. Rest of body blackish, with traces of 3 or 4 obscure darker longitudinal bands on soft dorsal and anal. I examined 611 specimens in the Honolulu markets in December 1922 and January 1923. The Agassiz Museum has 1 from the Society Islands and 1 from the Kingsmills, obtained by Andrew Garrett.

This species may be known by the coloration, the pale incomplete preocular band and fine longitudinal lines. In alcoholic specimens all have several dark longitudinal lines on the soft dorsal and anal. Evidently *Acanthurus bariene* is the oldest name for this species. It is described originally as follows: D. IX, 27; A. III, 25. Snout short, obtuse. Teeth crenulated. Forehead very convex. Caudal spine very sharp, slender. Caudal crescentic. Pectoral obtuse. Entirely brown. Dorsal with broad blue border, also blue basal line. Length 192 mm. Valenciennes renames this species *Acanthurus dussumieri* and a larger specimen, 305 mm. long, as *Acanthurus nummifer*. Teeth 16 to 20 in each jaw. Brown, with round blue-black blotch at gill opening above; sheath of caudal spine bordered violet-black, dorsal and anal each with basal blue line and latter with blue edge; dorsal edge with 2 or 3 narrow violet lines. The larval *Acanthurus argenteus* Quoy and Gaimard has been placed with *Hepatus nigricans* (Linné) by Klunzinger.

Mauritius, East Indies, Micronesia, Polynesia, Hawaii.

Hepatus lineolatus (Valenciennes).

Acanthurus lineolatus Valenciennes: Hist. nat.

Poiss., vol. 10, p. 152, 1835 (type loc., Mer des Indies).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 112, pl. 73, fig. A, 1875 (Raiatea, Society Islands).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 493, 1900 (Honolulu).

Hepatus lineolatus Fowler: B. P. Bishop Mus., Bull. 22, pp. 28, 34, 1925 (Honolulu; Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 19, 1925 (Laysan, French Frigates Shoal, Johnston islands).—Fowler: op. cit., Bull. 38, p. 20, 1927 (Washington and Jarvis islands).

Teuthis atrimentatus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 198, 1902 (1903) (type loc., Honolulu).—Jenkins: op. cit., vol. 22, p. 478, 1902 (1903) (Honolulu).—Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 133, 1902 (1903) (Marcus Island).

Teuthis atramentatus Snyder: U. S. Fish Comm., Bull., vol. 22, p. 533, 1902 (1904) (Laysan Island).

Hepatus atramentatus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 393, fig. 171, 1903 (1905) (Honolulu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 352, 1905 (1906) (Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 19, 1925 (Laysan).

Hepatus atrimentatus Fowler and Silvester: Carnegie Inst., Marine Pap., p. 124, 1922 (Pago Pago).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).

Acanthurus atramentatus Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 65, 1922 (Hawaii).

Teuthis matoides (part) Jenkins: (U. S.) Bur. Fish., Bull., vol. 22, p. 478, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 387, 1903 (1905) (Honolulu).

Hepatus nigricans (part) Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 351, 1905 (1906) (Apia).

Hepatus elongatus (part) Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 352, 1905 (1906) (Apia).

Teuthis elongatus Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, no. 7, p. 308, 1911 (Truck).

Head 3 2/5 to 3 2/3, young 2 3/5 to 2 3/4; depth 1 3/4 to 1 4/5, young 1 2/3 to 1 7/8; D. IX, 25, 1 to 29, 1; A. III, 24, 1 to 26, 1; snout 1 1/3 to 2 in head; eye 2 to 4 3/4; maxillary 3 1/2 to 4 3/4; interorbital 3 1/8 to 3 3/5. Head width 1 7/8 to 2 1/3 in its length. Gill rakers 5 + 21, short, weak, 1/6 of gill filaments, which 1 1/8 in eye. Scales with 24 to 27 apical denticles, basal elements in 5 or 6 series; circuli extremely fine. Ninth dorsal spine 1 2/3 in head; tenth dorsal ray 1 1/2; third anal spine 2 1/8; tenth anal ray 1 3/5; caudal to tips of median rays 1 2/5; pectoral and ventral both slightly longer than head.

Nearly bone-brown, body more or less uniform. Traces of 3 or 4 very obscure darker longitudinal dark bands on anal in 1 example, otherwise dorsals and anals largely dusky or with dull blackish tinge. Both adults show obscure blackish blotch little smaller than pupil at last dorsal and anal ray bases, though in young only present at last 2 dorsal rays. Caudal colored like trunk. Pectoral pale or dull brown. The longitudinal blue lines, not now visible, and only in young traces of few evident.

In the Academy 3 Hawaiian specimens, 5 from Oahu through W. H. Jones and 1 Pago Pago. Largest 165 mm. The Bishop Museum has 2 from Honolulu, 2 Hilo, 2 Marcus Island, 1 Tubuai. Largest 235 mm. I found 5 at Pearl City October 15, 1922, 5 at Laie November 4 and 490 specimens in the Honolulu markets during November and December 1922 and January 1923. Also 4 from Laysan, 1 French Frigates Shoal and 5 Johnston Island in 1923. In the National Museum the type of *Teuthis atrimentatus*, 1 from Hawaii as *Hepatus bipunctatus*, 2 from Apia as *Hepatus elongatus*, 1 from Apia as *Hepatus nigricans*, 4 from Honolulu, 3 from Honolulu as *Teuthis matoides*, and 1 from Truk as *Teuthis elongatus*. In the Agassiz Museum 1 Honolulu, 1 Oahu, 6 Hawaii, 1 Poona and Hilo, of which most from Andrew Garrett, 1 Ebon Island, Marshall Islands, through Rev. B. G. Snow.

East Indies, Micronesia, Polynesia, Hawaii.

Hepatus olivaceus (Schneider).

Acanthurus nigricans var. *olivaceus* Schneider: Systema ichth., Bloch, pp. xxxviii, 214, 1801 (type loc., Tahiti [on Forster]).

Acanthurus olivaceus Kittlitz: Mus. Senckenberg., vol. 1, p. 192, pl. 12, fig. 1, 1834 (Anoun Island, Caroline Islands).—Günther: Cat. fishes Brit. Mus., vol. 3, p. 336, 1861 (type; Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 20, 1869 (Viti Islands).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 113, 1875 (Society Islands; Paumotu; Samoa; Pelew Islands; Hawaiian islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 354, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 266, 1883 (Hood Bay, New Guinea).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 372, 1897 (Rotuma).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 493, 1901 (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 65, Dec. 1922 (Hawaii).

Rhombotides olivaceus Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 38, 1878 (New Guinea).

Teuthis olivaceus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 107, 1900 (Agaña, Guam).—Seale: op. cit., vol. 1, no. 5, p. 16, 1902 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 476, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 533, 1902 (1904) (Honolulu; Puako Bay).

Hepatus olivaceus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 385, fig. 166, 1903 (1905) (Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 66, 1906 (Tahiti).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 350, 1905 (1906) (Apia).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 28, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 18, 1925 (Johnston Island).

Acanthurus eparai Lesson: Voyage "Coquille," vol. 2, pt. 1, p. 147, pl. 27, fig. 1, 1830 (type loc., Tahiti).

Acanthurus humeralis Valenciennes: Hist. nat. Poiss., vol. 10, p. 170, 1835 (type loc., Carolines; Tahiti).—Eydoux and Souleyet: Voyage "Bonite," Zool., vol. 1, p. 169, pl. 2, fig. 3, 1841 (Hawaii).—Kittlitz: Denkw. Reise Mikronesien, vol. 2, pp. 123, 160, fig., 1858 (N. 8° 33′—9° W. 209° 29′—210° 13′ Ulea).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).

Harpurus paroticus Lichtenstein: Descriptiones animalium, p. 183, 1844 (type loc., Tahiti).

Head 3 1/2; depth 2 1/8; D. IX, 24, 1; A. III, 23, 1; snout 1 2/5 in head; eye 4 2/3; maxillary 4 2/3; interorbital 3 1/2. Head width 1 9/10 in its length. Gill rakers 8 + 18, lanceolate, weak, 1/6 of gill filaments, which equal eye. Scales with 12 to 15 apical denticles, basal elements in 3 to 5 series; circuli extremely fine.

Nearly warm sepia generally. Horizontal pale yellowish band from upper angle of gill opening extends back not quite far as depressed pectoral, bordered with dusky. Hind pectoral edge broadly and inner caudal emargination pale or yellowish-brown. Dorsals, anal and ventral largely tinged dusky.

One in the Academy from Honolulu, 245 mm. The Bishop Museum has 14 from Honolulu, 1 Agaña on Guam and 6 from Tahiti. Largest 337 mm. I found 263 specimens in the Honolulu markets during November and December 1922. The National Museum has 2 from Apia and 1 from the Hawaiian islands. In the Agassiz Museum 3 from the Society Islands and 2 from the Kingsmills, all obtained by Andrew Garrett.

East Indies, Micronesia, Polynesia, Hawaii.

Hepatus pyroferus (Kittlitz).

Acanthurus pyroferus Kittlitz: Mus. Senckenberg., vol. 1, p. 193, pl. 12, fig. 2, 1834 (type loc., Ulea Island, Carolines).—Kittlitz: Denkw. Reise Mikronesien, vol. 2, p. 160, 1858 (Ulea).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 113, 1875 (copied).

Acanthurus armiger Valenciennes: Hist. nat. Poiss., vol. 10, p. 172, 1835 (no type locality; Russian expedition Capt. Lütke [Carolines]).—Kittlitz: Denkw. Reise Mikronesien, vol. 2, p. 160, 1858 (Ulea).

Head 4 1/4; depth 2 1/8; D. VII, 29; A. III, 25; snout 1 1/3 in head; eye 5, 3 3/4 in snout. Profile of snout concave, so muzzle produced. Caudal spine moderate. Soft dorsal and anal with posterior rays longest. Caudal deeply lunate, points exserted. Dark brown, largely uniform. Blackish blotch behind gill opening with yellowish vertical blotch. Hind caudal edge broadly yellow. Iris blue, with yellow ring around pupil. Young with dark yellowish ground-color. Length 230 mm. (Kittlitz)

Readily distinguished by the reduced dorsal spines.

Hepatus nigricans (Linné).

Chaetodon nigricans Linné: Systema nat., 10th ed., p. 274, 1758 (type loc., Red Sea).

Harpurus nigricans Forster: Fauna Indica, p. 15, 1795 (India).—Lichtenstein: Descriptiones animalium, p. 214, 1844 (tropical Pacific islands; Tahiti).

Teuthis nigrosus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 20, 21, 1902 (Honolulu).

Hepatus nigricans Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 66, 1906 (Tahiti; Faté; Shortland Island; Raiatea).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 351, 1905 (1906) (Pago Pago).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 386, Dec. 1923 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 18, 1925 (Johnston and Wake islands).

Teuthis nigricans Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 26, p. 308, 1911 (Suva, Fiji).

Acanthurus gahm Günther: Mus. Godeffroy, Jour., vol. 4, p. 113, pl. 74, 1875 (Society Islands; Paumotus · Samoa; Hervey Islands; Kingsmills; Gilbert Islands).—Günther: Rept. voyage "Challenger," vol. 1, p. 35, 1880 (Kandavu, Fiji).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 354, 1882 (New Guinea).

Hepatus gahm Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1393, 1906 (Upolu).

The Bishop Museum has 1 from Honolulu, 108 mm. long, apparently one of the specimens reported by Seale as *Teuthis nigrosus*. Others are 2 from Tahiti, 1 Raiatea, 1 Faté and 1 Shortland Island. Largest 199 mm. Also 3 from Johnston Island and 1 from Wake Island in 1923. In the National Museum 1 from New Guinea, 2 from Apia, and 1 from Suva. The Agassiz Museum has an adult from the Hawaiian islands, 9 from the Society Islands and 4 from the Kingsmills, all obtained by Andrew Garrett.

Red Sea, Mauritius, India, East Indies, Melanesia, Micronesia, Polynesia, Hawaii.

Hepatus glaucopareius (Schneider).

Harpurus glaucopareius (Forster) Schneider: Systema ichth., Bloch, p. 212, 1801 (type loc., Tahiti).

Acanthurus glaucopareius Kittlitz: Mus. Senckenberg., vol. 1, p. 193, pl. 13, fig. 3, 1834 (Ulea).—Valenciennes: Hist. nat. Poiss., vol. 10, p. 139, 1835 (Oualan).—Thiollière: Fauna Woodlark, p. 178, 1857 (Woodlark Island).—Kittlitz: Denkw. Reise Mikronesien, vol. 2, p. 160, 1858 (Ulea).—Günther: Cat. fishes Brit. Mus., vol. 3, p. 339, 1861 (Tahiti).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 20, 1869 (Viti Islands; Samoa).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 114, pl. 71, fig. A, 1875 (Polynesia).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 265, 1883 (Hood Bay, New Guinea).

Hepatus glaucopareius Fowler: B. P. Bishop Mus., Bull. 38, p. 20, 1927 (Fanning and Jarvis islands).

Acanthurus ali-ala Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 150, 1830 (type loc., Oualan, Carolines).

Teuthis aliala Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 496, 1899 (Thornton Island).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 109, 1900 (Agaña, Guam).

Hepatus aliala Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 350, 1905 (1906) (Apia; Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 22, p. 12, 1925 (Guam).

Acanthurus kaber (Montrouzier) Thiollière: Fauna Woodlark, p. 178, 1857 (name in synonymy).

Acanthurus blochi (non Valenciennes) Streets: U. S. Nat. Mus., Bull. no. 7, p. 68, 1877 (Honolulu).

Hepatus matoides (non Valenciennes) Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 352, 1905 (1906) (Apia).

Head 3 2/5 to 3 2/3; depth 1 4/5 to 2; D. IX, 29, 1 or 30, 1; A. III, 27, 1 or 28, 1; snout 1 1/5 to 1 1/3 in head; eye 3 1/2 to 3 4/5; maxillary 4 to 4 1/3; interorbital 2 4/5 to 3. Head width 1 2/3 to 1 4/5 in its length. Least depth of caudal peduncle 2 3/4 in head. Ninth dorsal spine 2 1/4; tenth dorsal ray 1 2/3; third anal spine 1 7/8; tenth anal ray 1 4/5; caudal to tips of median rays 1 1/4; ventral 1 1/3; pectoral half eye diameter longer than head.

Dried skin blackish-brown. Pale line along dorsal and anal bases, widening behind until at last rays, 4/5 their height. Caudal pale, with pale brown submarginal line adjoining yellowish crescent. Pale brownish blotch below eye, somewhat deeply crescentic and narrow pale ring behind lips encircles jaws.

In the Academy 1 from Thornton Island 220 mm. The Bishop Museum has 13 from Agaña on Guam in 1900. Also 1 from Guam in 1923. In the National Museum 3 from Samoa, 3 from Honolulu by T. H. Streets as *Acanthurus blochi* and 3 from Samoa, also 6 from Apia as *Hepatus matoides*.

East Indies, Micronesia, Melanesia, Polynesia.

Hepatus leucosternon (Bennett).

Acanthurus leucosternon Bennett: Zool. Soc. London, Proc., p. 183, 1832 (type loc., Ceylon).—Günther: Cat. fishes Brit. Mus., vol. 3, p. 340, 1861 (type).

Acanthurus celebicus Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 761, 1852 (type loc., Macassar, Celebes).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (1860) (Doreh, New Guinea).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, 1860, p. 99 (New Guinea).—Günther: Cruise of "Curaçoa" (Brenchley), p. 410, 1873

(Solomons).—Günther: Journ. Mus. Godeffroy, vol. 4, p. 115, pl. 73, fig. B, 1875 (Solomons; Tahiti).

Head 3 3/5; depth 1 4/5; D. VIII or IX, 25 or 26; A. III, 24; snout 1 1/3 in head, profile little concave; eye 3 1/2, 2 3/5 in snout; upper teeth 14. Caudal spine nearly long as eye. Soft dorsal and anal somewhat pointed behind where but little shorter than head. Caudal emarginate, long as head; pectoral 1; ventral 1 1/8. Olivaceous to brown, with grayish on head and most of vertical fins. Pectoral and caudal posteriorly yellowish. Hind edge of gill opening blackish. Whitish crescent across muzzle below. Length 180 mm. (Günther)

This species may be known by its large scales, given by Bleeker as 80 in a lateral series and its coloration. Of the latter especially diagnostic is the white chin band in combination with the black opercular edge. Bleeker's type was 225 mm. long.

East Indies, Melanesia, Polynesia.

Hepatus achilles (Shaw).

Acanthurus achilles Shaw: Gen. zool., vol. 4, p. 383, 1803 (no type locality).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 20, 1869 (MacKean Island; Samoa).—Schmeltz: op. cit., Cat. 5, p. 30, 1874 (Samoa; Phoenix Islands; Tahiti).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 115, pl. 71, fig. B, 1875 (Samoa; Polynesia).—Streets: U. S. Nat. Mus., Bull. 7, p. 87, 1877 (Fanning Islands).—Waite: Australian Mus., Mem., no. 3, p. 188, 1897 (Funafuti, Ellice Islands).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 493, 1901 (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 65, Dec. 1922 (Hawaii).

Teuthis achilles Fowler: Acad. Nat. Sci. Philadelphia, p. 494, 1899 (Thornton Island).—Fowler: op. cit., p. 513, 1900 (Hawaiian islands).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 21, 1902 (Honolulu).—Bryan and Herre: op. cit., vol. 2, no. 1, p. 134, 1902 (1903) (Marcus Island).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 475, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 533, 1902 (1904) (Honolulu; Puako Bay).

Hepatus achilles Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 384, pl. 58, 1903 (1905) (Honolulu; Samoa).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 66, 1906 (Rarotonga; Makatea).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1393, 1906 (Upolu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 350, 1905 (1906) (Apia; Pago Pago).—Fowler: Copeia, no. 112, p. 84. Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 28, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 18, 1925 (French Frigates Shoal, Johnston and Wake islands).—Fowler: op. cit., Bull. 38, p. 19, 1927 (Washington and Jarvis islands).

Head 2 7/8 to 3 1/2; depth 1 3/5 to 1 5/6; D. IX, 30, 1 to 32, 1; A. III, 28, 1 to 30, 1; snout 1 1/3 to 1 2/5 in head; eye 3 1/3 to 4; maxillary 4 1/2 to 5; interorbital 3 to 3 1/3. Head width 2 1/5 in its length. Gill rakers 7 + 12, slender, weak, lanceolate, 1/6 of gill filaments, which 1 2/5 in eye. Scales with apical denticles 14 to 22, basal elements in 3 to 5 series; circuli extremely fine.

Nearly seal-brown, faded specimens more or less uniformly snuff-brown with markings largely paler. Iris slaty. Pearl-white along hind edge of gill opening. Fins, except caudal, more or less dark to dusky. Pectoral with olive tinge. Pale brown basal line along soft dorsal and anal, widening little at last rays. Large ovoid naked area before caudal spine pale brown. Caudal pale brown, border broadly whitish, with submarginal dusky line all around defining warmer median region and base of fin dusky.

In the Academy 6 Hawaiian specimens, of which 4 obtained by J. K. Townsend, and 3 from Thornton Island. Largest 235 mm. In the Bishop Museum 10 from Honolulu, 1 Makatea, 1 Rarotonga, 1 Marcus Island. Largest 238 mm. I found only 1 in the Honolulu markets, November 18, 1922. Also 5 from French Frigates Shoal, 3 from Johnston Island and 2 from Wake Island. The National Museum has 3 Hawaiian specimens, 1 Apia, and 3 Fanning Islands through T. H. Streets. In the Agassiz Museum 1 from the Society Islands through Andrew Garrett.

China, Micronesia, Polynesia, Hawaii.

Paracanthurus theuthis (Lacépède).

Acanthurus theuthis Lacépède: Hist. nat. Poiss., vol. 4, pp. 547, 549, 1802 (type loc., Amboina [Carolina *Teuthis hepatus* Linné]).

Acanthurus teuthis Shaw: Gen. zool., vol. 4, p. 377, 1803 (Indian [and American] seas).

Acanthurus hepatus (non Linné) Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 30, 1874 (Pelew Islands).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 115, pl. 75, 1875 (Kingsmills).—Peters: Akad. Wiss. Berlin, Monatsb., p. 835, 1876 (1877) (New Britain).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 353, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 266, 1883 (Hood Bay, New Guinea).

Colocopus lambdurus Gill: U. S. Nat. Mus., Proc., vol. 7, p. 279, 1884 (1885) (on Günther 1875).

Head 3 1/2; depth 2 1/4; D. IX, 20; A. III, 19; snout 1 1/2 in head; eye 4 1/4; maxillary 4 1/10; interorbital 3 2/5.

Body ovate, well compressed. Caudal peduncle compressed, long as deep, least depth 3 1/8 in head. Head width 2 1/5 in its length. Snout compressed, width 2 1/3 in its length. Eye elevated, front edge slightly behind middle in head length; diameter 4 1/8 in snout, 1 1/4 in interorbital; short oblique preorbital groove 4/5 of eye diameter. Mouth small, lower jaw slightly shorter. Teeth compressed, close set, each with 7 cusps. Nostrils small, close together above preorbital groove. Interorbital convex. Gill openings 1 3/5 in head. Scales all roughly granular, enlarged on sides of snout and interorbital. Fifth dorsal spine 2 1/10 in head; first dorsal ray 2 1/2; third anal spine 2 1/3; third anal ray 2 2/5; caudal spine 3 1/4; caudal 1 1/4, slightly concave behind; pectoral 1 1/8; ventral 2 1/10, spine very robust and rays 3.

Brown, body largely uniform. From upper eye edge to back and thence to caudal spine and out along upper edge of caudal fin deep brown area; forks in front of caudal spine and extends smiliarly down along lower caudal edge, then forward to leave large oval space, color of belly over costal region; median portion of caudal fin and caudal peduncle yellowish-brown. Dorsals and anals pale brownish, with dark margins. Pectoral deep brown basally, terminally pale along hind edge. Ventral pale brown, like belly. Length 180 mm.

In the Agassiz Museum 2 from the Kingsmill Islands, obtained by Andrew Garrett.

Bleeker has given the generic name *Paracanthurus* to this species which replaces the

later *Colocopus* Gill. Likewise *Acanthurus theuthis* Lacépède antedates *Colocopus lambdurus* Gill as the correct specific name. The generic character, separating it from *Hepatus* is based on the presence of only 2 or 3 soft ventral rays (compared with 5 in *Hepatus*).

Mauritius, East Indies, Melanesia, Micronesia.

Ctenochaetus strigosus (Bennett).

Acanthurus strigosus Bennett: Zool. jour., vol. 4, p. 41, 1828 (type loc., Hawaii).—Valenciennes: Hist. nat. Poiss., vol. 10, p. 179, 1835 (New Guinea).—Günther: Cat. fishes Brit. Mus., vol. 3, p. 342, 1861 (type).—Kner: Reise "Novara," Fische, vol. 1, p. 211, 1865 (Tahiti).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 116, pl. 79, figs. B-C, 1875 (Hawaiian islands; Polynesia).—Peters: Akad. Wiss. Berlin, Monatsb., p. 835, 1876 (1877) (New Britain).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 15, 1877 (Tahiti).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 354, 1882 (New Guinea).

Acanthurus (Ctenodon) strigosus Steindachner Akad. Wiss. Wien, Denk., vol. 70, p. 494, 1901 (Honolulu).

Ctenochaetus strigosus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 480, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 534, 1902 (1904) (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 13, 28, 34, 1925 (Guam; Honolulu; Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 19, 1925 (Laysan, French Frigates Shoal, Johnston and Wake islands).—Fowler: op. cit., Bull. 38, p. 20, 1927 (Fanning, Christmas, Jarvis islands).

Acanthurus striatus (non Quoy and Gaimard) Valenciennes: Hist. nat. Poiss., vol. 10, p. 168, 1835 (Hawaiian islands; part).

Ctenochaetus striatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 109, 1900 (Guam).—Seale: op cit., vol. 1, no. 5, p. 16, 1902 (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 398, fig. 174, 1903 (1905) (Honolulu; Hilo; Napoopoo).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 67, 1906 (Tahiti; Raiatea; Rarotonga; Faté; Tubuai; Shortland Island).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1393, 1906 (Upolu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 355, 1905 (1906) (Apia).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 356, 1906 (Tahiti).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 311, 1911 (Papeete, Tahiti).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 145, 1912 (Mangareva).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 66, Dec. 1922 (Hawaii).

Acanthurus ctenodon Valenciennes: Hist. nat. Poiss., vol. 10, p. 178, pl. 289, 1835 (type loc., Caroline Islands; New Guinea).—Günther: Cat. fishes Brit. Mus., vol. 3, p. 342, 1861 (Aneiteum, New Hebrides).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 20, 1869 (Samoa).—Günther: Cruise of "Curacoa" (Brenchley), p. 410, 1873 (Solomons).—Peters: Akad. Wiss. Berlin, Monatsb., p. 835, 1876 (1877) (New Britain; New Ireland).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 38, 1878 (New Guinea).

Head 2 2/5 to 2 2/3; depth 1 3/4 to 2; D. VIII or IX. 28, 1 to 30, 1; A. III, 25, 1 to 27, 1; snout 1 2/5 to 1 4/5 in head; eye 2 3/4 to 4; maxillary 3 3/4 to 3 4/5; interorbital 3 to 3 1/2. Head width 1 7/8 to 2 1/8 in its length. Gill rakers 9 + 23, lanceolate, short, weak, 1/5 of gill filaments, which equal eye. Scales with 18 to 21 apical denticles, with 7 to 13 basal elements; circuli extremely fine. Largely fuscous-black, nearly uniform. Vertical fins and ventrals with more or less dusky. Pectoral tinged brownish.

In the Academy 1 Hawaiian islands from J. K. Townsend and 10 from Apia. Largest 192 mm. The Bishop Museum has 9 from Honolulu, 1 Palmyra Island through C. Montague Cooke, Jr. in 1913, 9 Tahiti of which 3 from Papeete, 1 Rarotonga, 2 Raiatea, 2 Shortland Island, 3 Faté, 1 Tubuai, 2 Guam. Largest 287 mm. I examined 591 specimens in the Honolulu markets during November 1922 and January 1923. Also 3 from Guam in 1923, 2 Laysan, 7 French Frigates Shoal, 1 Johnston Island and 2 Wake Island. The National Museum has 21 Hawaiian specimens, 1 from Tahiti through Capt. William Stimpson; 12 Apia, and 10 Mangareva; 4 from New Guinea, 2 by the Albatross Expedition. In the Agassiz Museum 8 Apia, 3 Mangareva, 4 Ascension Island through Rev. A. A. Strong, 3 Kingsmills, 3 Society Islands and 5 Hawaiian of which 4 from Poona, of which three last localities through Andrew Garrett.

An abundant species readily distinguished by its bristle-like teeth.

Red Sea, Zanzibar, Ceylon, East Indies, Micronesia, Melanesia, Polynesia, Hawaii.

Zebrasoma flavescens (Bennett) (Pl. XXXII, *A*).

Acanthurus flavescens Bennett: Zool. jour., vol. 4. p. 40, 1828 (type loc., Hawaiian islands).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 116, pl. 76, 1875 (Society Islands; Tahiti; Samoa; Hawaiian islands; New Hebrides).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 354, 1882 (New Guinea).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 372, 1897 (Rotuma).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 493, 1901 (Honolulu).

Scopas flavescens Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 480, 1902 (1903) (Honolulu).—Snyder: op. cit., p. 533, 1902 (1904) (Honolulu; Puako Bay, Hawaii).

Zebrasoma flavescens Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 134, 1902 (1903) (Marcus Island).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 944, 1904 (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, no. 1, p. 397, pl. 59, 1903 (1905) (Kailua; Honolulu).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1393, 1906 (Upolu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 67, 1906 (Raiatea).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 66, Dec. 1922 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 28, 34, 1925 (Honolulu; Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 19, 1925 (Johnston Island).

Acanthurus virgatus Vaillant and Sauvage: Rev. mag. zool., vol. 3, p. 283, 1875 (type loc., Honolulu).

Zebrasoma agaña Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 110, 1901 (type loc., Agaña, Guam).

Head 2 1/2 to 2 3/5; depth 1 1/3 to 1 3/5; D. V, 24, 1 or 25, 1; A. III, 20, 1; snout 1 2/5 to 1 1/2 in head; eye 3 to 4; maxillary 4 3/4 to 6; interorbital 3 3/4 to 4. Head width 2 1/3 to 2 3/5 in its length.

Largely fuscous-black, trunk and head more fuscous. Indistinct numerous waved longitudinal grayish fine lines along side of abdomen, apparently not above arch

of lateral line and uppermost more or less broken, or as various dots, bars, etc. Pectoral tinted olive.

Three in the Academy from Apia, 62 to 87 mm. In the Bishop Museum 29 from Honolulu, 1 Marcus Island, 3 Raiatea and 1 Laysan through W. A. Bryan in 1903. Also types of *Zebrasoma agaña*. Largest 150 mm. I found 4 in the Honolulu market in December 1922. Three from Johnston Island in 1923. The National Museum has 8 Hawaiian specimens, of which 3 from Honolulu.

East Indies, Melanesia, Micronesia, Polynesia, Hawaii.

Zebrasoma rhombeum (Kittlitz).

Acanthurus rhombeus Kittlitz: Mus. Senckenberg., vol. 1, p. 196, pl. 13, fig. 16, 1834 (type loc., Ulea Island, Carolines).—Günther: Cat. fishes Brit. Mus., vol. 3, p. 342, 1861 (Aneiteum; Hawaiian islands).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 20, 1869 (Samoa).—Peters: Akad. Wiss. Berlin, Monatsb., p. 835, 1876 (1877) (New Britain).—Günther: Rept. voyage "Challenger," Zool., vol. 1, p. 35, 1880 (Levuka, Fiji).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 229, 1898 (Saypan, Mariannes).

Acanthurus rhombus Kittlitz: Denkw. Reise Mikronesien, vol. 2, p. 60, 1858 (Ulea).

Harpurus rhombeus Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 38, 1878 (New Guinea).

Zebrasoma rhombeum Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 355, 1905 (1906) (Pago Pago; Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 311, 1911 (Tahoa, Society Islands).—Fowler: B. P. Bishop Mus., Bull. 22, p. 34, 1925 (Samoa).

Zebrasoma flavescens rhombeum Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 356, 1906 (Tahiti).

Acanthurus scopas Valenciennes: Hist. nat., Poiss., vol. 10, p. 180, pl. 290, 1835 (type loc., Doreh Harbor, New Guinea; Mauritius; Ulea).—Thiollière: Fauna Woodlark, p. 181, 1857 (Woodlark Island).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).

Zebrasoma rostratum (non Günther) Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 356, 1905 (1906) (Samoa).

Zebrasoma veliferum (non Bloch) Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 28, no. 7, p. 311, 1911 (Tahaa, Society Islands).

The National Museum has 2 from New Guinea and 4 from Apia as *Zebrasoma rostratum*, also 2 from Tahaa as *Zebrasoma veliferum*. The Agassiz Museum has 2 from Apia and 6 from the Society Island through Andrew Garrett. Largest 190 mm.

Mauritius, Bourbon, East Indies, Melanesia, Micronesia, Polynesia.

Zebrasoma rostratum (Günther).

Acanthurus rostratus Günther: Mus. Godeffroy, Jour., vol. 4, p. 117, pl. 66, fig. B, 1875 (type loc., Society Islands).

Head 3; depth 2; D. V, 24; A. III, 20; snout 1 1/5 in head; eye 5, 3 3/4 in snout. Muzzle slender, produced. Caudal spine long as eye. Soft dorsal and anal elevated, height of former nearly equals head. Hind caudal edge little convex. Uniform black. Length 178 mm. (Günther)

Zebrasoma veliferum (Bloch) (Pl. XXXII, *B*).

Acanthurus velifer Bloch: Nat. ausländischen Fische, pt. 9, p. 106, pl. 427, fig. 1, 1795 (no type locality [Collection John]).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 20, 1869 (Samoa).—Schmeltz: op. cit., Cat. 5, p. 30, 1874 (Viti Islands; Samoa; Tahiti).

Zebrasoma veliferum Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 396, fig. 173, 1903 (1905) (Honolulu; Samoa).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 67, 1906 (Tahiti; Raiatea).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 356, 1905 (1906) (Pago Pago; Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 311, 1911 (Tahoa, Society Islands).—Kendall and Radcliffe: op. cit., vol. 35, p. 145, 1912 (Rikitea, Mangareva, Paumotus).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 66, December 1922 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 28, 1925 (Honolulu).——Fowler: B. P. Bishop Mus., Bull. 38, p. 20, 1927 (Honolulu).

Acanthurus blochii Bennett: Zool. Soc. London, Proc., p. 207, 1835 (type loc., Tranquebar) (on *Acanthurus velifer* Bloch).

Acanthurus maristarum Thiollière: Fauna Woodlark, p. 180, 1857 (type loc., Woodlark Island).

Acanthurus viaged (Montrouzier) Thiollière: Fauna Woodlark, p. 180, 1857 (name in synonymy).

Acanthurus ruppelli Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, 1859, (Doreh, New Guinea).

Acanthurus hypselopterus Günther: Mus. Godeffroy, Jour., vol. 4, p. 117, 1875 (Fiji; Samoa; Pelew Islands).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 15, 1877 (Pelew Islands; Ponapé).

Acanthurus (*Harpurus*) *hypselopterus* Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 494, pl. 4, fig. 1, 1901 (Honolulu).

Zebrasoma hypselopterus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 479, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 553, 1902 (1904) (Honolulu).

The National Museum has 1 from Samoa, obtained by the Wilkes Expedition. Other materials 2 from New Guinea, 5 Hawaiian, 2 Tahaa in the Society Islands, 1 Rikitea, and 3 Apia. The Bishop Museum has 17 from Honolulu, 1 Tahiti and 1 Raiatea. Largest 395 mm. In the Agassiz Museum 1 from Maui, 7 Society Islands through Andrew Garrett, 10 Kingsmills also from Garrett and 1 Ebon Island through Rev. B. G. Snow in April 1877.

Madagascar, Mauritius, Bourbon, Seychelles, East Indies, Micronesia, Melanesia, Polynesia, Hawaii.

Naso thynnoides (Valenciennes).

Axinurus thynnoides Valenciennes: Hist. nat. Poiss., vol. 10, p. 221, pl. 293, 1835 (type loc., Doreh Harbor, New Guinea).

Head 4 3/5; depth 3; D. IV, 28; A. II, 28; snout 2 in head; eye 3 1/5, 1 1/2 in snout. Body elongate, profiles alike. Caudal peduncle very slender. Snout with convex profile. Mouth small and maxillary short. Teeth very slender, small. Oblique preorbital groove below nostrils. Single keeled buckler each side of caudal peduncle. Dorsal spines subequal, about long as snout, soft rays graduated down posteriorly. Anal inserted opposite third dorsal ray, soft rays like soft dorsal. Caudal deeply emarginate, lunate. Pectoral 1 1/4 in head, ventral 2. Body uniform gray. Dorsals and anals grayish, with slightly oblique dark lines. Pectoral tinged yellowish. Length 25 mm. (Valenciennes)

Naso lituratus (Schneider) (Pl. XXXIII, *A*).

Acanthurus lituratus Schneider: Systema ichth., Bloch, p. 216, 1801 (no type locality) (on Forster).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 20, 1869 (Viti Islands; Samoa).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 358 1905 (1906) (Apia).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 356, 1906 (Tahiti).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 13, 28, 34, 1925 (Guam; Honolulu; Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 27, p. 19, 1925 (Johnston and Wake islands).

Harpurus lituratus (Forster) Schneider: Systema ichth., Bloch, p. 216, 1801 (name in synonymy).—Lichtenstein: Descriptiones animalium, p. 218, 1844 (Tahiti).

Naseus lituratus Valenciennes: Hist. nat. Poiss., vol. 10, p. 208, 1835 (Tahiti; New Ireland; Ulea).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).—Günther: Cat. fishes Brit. Mus., vol. 3, p. 353, 1861 (Aneiteum).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 124, pl. 82, 1875 (Hawaiian and Society islands).—Peters: Akad. Wiss. Berlin, Monatsb., p. 836, 1876 (1877) (New Ireland).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 354, 1882 (New Guinea).—Smith and Swain: U. S. Nat. Mus., Proc., p. 139, 1882 (Johnston Island).—Waite: Australian Mus., Mem., no. 3, p. 188, 1897 (Funafuti, Ellice Islands).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma).

Naseus litturatus Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 495, 1901 (Honolulu).

Monoceros lituratus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 113, 1900 (Agaña, Guam).

Callicanthus lituratus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 481, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 534, 1902 (1904) (Honolulu; Puako Bay).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 404, fig. 177, 1903 (1905) (Honolulu; Homuapo; Hilo).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 67, Dec. 1922 (Hawaiian islands).

Monoceros garrettii Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 112, 1900 (type loc., Guam).

Acanthurus garretti Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 67, 1906 (Tahiti; Raiatea; Rarotonga).

Head 3 1/8; depth 1 5/6; D. VI, 29, 1; A. II, 29, 1; snout 1 1/3 in head; eye 4; maxillary 3 7/8; interorbital 3 3/4; head width 2 1/8. Largely fuscous. Pale brown line forward from eye until near end of muzzle, then down close behind maxillary. Dorsals fuscous-black, with broad pale brown edge to soft fin, edge narrowly dusky. Anal largely fuscous-black, membranes olivaceous medianly, leaving submarginal blackish line and edge narrowly whitish. Caudal like body, hind edge whitish, with submarginal parallel crescent. Each caudal spine within pale olive-gray blotch. Pectoral fuscous, fourth ray and hind basal region pale brownish. Ventral fuscous to dusky.

One in the Academy from the Hawaiian Islands, 143 mm. In the Bishop Museum 6 cotypes of *Monoceros garrettii* besides 1 specimen from Agaña on Guam. Other materials 9 from Honolulu, 2 Raiatea, 3 Tahiti, 3 Rarotonga. Largest 375 mm. I found 21 specimens in the Honolulu markets in November and December 1922 and January 1923. Four from Guam in 1923, 4 Johnston Island and 1 Wake Island. The National Museum has 2 Hawaiian specimens, 3 Apia and 1 Johnston Island. The Agassiz Museum has 3 from Apia, 3 from Ascension Island from Rev. A. A. Strong, April 14, 1877, 3 Kingsmills, and 2 Society Islands through Andrew Garrett.

Suez, East Africa, Mauritius, East Indies, Melanesia, Micronesia, Polynesia, Hawaii.

Naso tuberosus Lacépède.

Naso tuberosus Lacépède: Hist. nat. Poiss., vol. 3, pp. 105, 111, pl. 7, fig. 3, 1802 (no type locality [on Commerson]).

Naseus tuberosus Günther: Cat. fishes Brit. Mus., vol. 3, p. 353, 1861 (Aneiteum).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 30, 1874 (Kingsmills).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 123, pl. 80, 1875 (Aneiteum).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 355, 1882 (New Guinea).

Aspisurus carolinarum Quoy and Gaimard: Voyage "Uranie," Zool., p. 375, pl. 63, fig. 1, 1825 (type loc., Carolines; Guam).

Naseus carolinarum Valenciennes: Hist. nat. Poiss., vol. 10, p. 212, 1835 (Guam).

Naseus tonganus (Quoy and Gaimard) Valenciennes: op. cit., vol. 10, p. 216, 1835 (type loc., Tongatabu).

Naseus vlamingii (non Valenciennes) Peters: Akad. Wiss. Berlin, Monatsb., p. 836, 1876 (1877) (New Britain).

Known by the very broad compressed hump on the snout, not a horn or a pointed projection. With age body covered with very numerous small variable blue dots. Soft dorsal and anal each with whitish border.

Aspisurus carolinarum Quoy and Gaimard is described with a very greatly variegated color figure. Its ground color is brownish with large irregular areas of greenish. Soft dorsal dark brown, with blue basal line longitudinally and broad white margin, though with a narrow dark line at edge of the fin. Anal reddish brown, with narrow whitish edge. Caudal grayish with narrow whitish and then slightly broader yellowish submarginal band parallel with crescentic edge. Paired fins pale, only pectoral blue gray basally. No frontal hump, the muzzle narrowly attenuate.

A specimen from New Guinea 208 mm. long, which agrees with Günther's plate of *Naseus tuberosus*. One in the Agassiz Museum from the Gilbert Islands obtained by Andrew Garrett.

Zanzibar, Mauritius, Ceylon, East Indies, Queensland, Micronesia, Melanesia, Polynesia.

Naso eoume (Lesson).

Prionurus eoume Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 151, 1830 (type loc., Matavai Bay, Tahiti).

Naseus vlamingii Valenciennes: Hist. nat. Poiss., vol. 10, p. 216, 1835 (type loc., Moluccas).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 123, pl. 81, 1875 (Ebon and Bonham Islands, Marshalls; Aneiteum).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 15, 1877 (Ponapé; Tahiti).

Monoceros vlamingii Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 493, 1899 (Thornton Island).

Acanthurus vlamingi Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 313, 1911 (Rangiroa, Paumotus).

Head 4 2/5 to 4 1/2 (from snout tip); depth 2 2/3 to 2 3/4; D. VI, 26, 1; A. II, 27, 1; snout 1 3/5 to 1 3/4 in head; eye 4 to 4 1/2; maxillary 3 2/3 to 4 3/4; in-

terorbital 3; head width 1 2/3 to 1 4/5. Dried skin nearly uniform blackish-brown. Traces of vertical bluish parallel lines, with spots above and below, obscure, mostly evident in larger specimen.

Two dried skins in the Academy from Thornton Island, 386 to 425 mm. Adult in the National Museum from the Paumotus.

East Indies, Melanesia, Micronesia, Polynesia.

Naso annulatus (Quoy and Gaimard) (Pl. XXXIII, *B*).

Priodon annulatus Quoy and Gaimard: Voyage "Uranie," Zool., p. 377 (Jan. 24-May 26) 1825 (type loc., Timor).

Naseus annulatus Günther: Cat. fishes Brit. Mus., vol. 3, p. 352, 1861 (Aneiteum, New Hebrides).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 20, 1869 (Viti Islands; Somoa).

Monoceros annulatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 113, 1900 (Agaña, Guam).

Teuthis annularis Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 15, 1902 (Hilo).

Naseus marginatus Valenciennes: Hist. nat. Poiss., vol. 10, p. 207, 1835 (type loc., Tongatabu, Friendly Islands).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 112, pl. 83, 1875 (Pelew Islands; Aneiteum).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 15, 1877 (Yap).—Günther: Rept. voyage "Challenger," vol. 1, p. 35, 1880 (Ovalau, Fiji).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 355, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 266, 1883 (Hood Bay, New Guinea).

Acanthurus incipiens Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 480, fig. 32, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 400, fig. 175, 1903 (1905) (Honolulu; Samoa).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 357, 1905 (1906) (Apia).—Fowler: B. P. Bishop Mus., Bull. 22, p. 13, 1925 (Guam).

Head 3 4/5; depth 2 1/8; D. VI, 27, 1; A. II, 28, 1; snout 1 2/3 in head; eye 3; maxillary 4 1/10; interorbital 3; first dorsal spine 1 3/4; first dorsal ray 2; second anal spine 2 2/3; first anal ray 2 2/3; least depth of caudal peduncle 5 3/4; pectoral 1 1/5; ventral 1 2/3; caudal 1 1/5. Length 125 to 155 mm.

In the Bishop Museum 2 from Agaña on Guam in 1900. Also 1 from Guam in 1923. The National Museum has the type of *Acanthurus incipiens* and a young specimen from Apia.

Zanzibar, East Indies, Queensland, Melanesia, Micronesia, Polynesia, Hawaii.

Naso brevirostris (Valenciennes) (Pl. XXXIII, *C*).

Naseus brevirostris Valenciennes: Hist. nat. Poiss., vol. 10, p. 204, pl. 291, 1835 (type loc., Moluccas; Mauritius; New Guinea).—Günther: Cat. fishes Brit. Mus., vol. 3, p. 349, 1861 (Port Resolution, Tanna; Aneiteum, New Hebrides).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 121, pl. 79, fig. A, 1875 (Kingsmills; Tahiti).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 15, 1877 (Pelew Islands).

Acanthurus brevirostris Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 481, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 534, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 401, fig. 176, 1903 (1905) (Honolulu).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1394, 1906 (Upolu).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 311, 1911 (Rangiroa, Paumotus).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 28, 1925 (Honolulu).

Head from snout tip 3 4/5; depth 2 2/5; D. VI, 28, 1; A. II, 28, 1; snout 1 3/5 in head; eye 3 7/8; maxillary 4 1/3; interorbital 2 7/8; head width 1 4/5. Back sepia, under surface snuff-brown. Dorsals and anals largely fuscous. Caudal brown, with submarginal brown line, wider medially, edge narrowly whitish behind. Edge of gill flap, behind opercle, creamy. No traces of bluish lines or bands on edges to soft dorsal and anal, as shown in Günther's figure. Moreover, Günther does not indicate hind edge of gill flap pale. Length 217 mm.

One in the Academy from the Hawaiian islands. Two obtained in the Honolulu markets in December 1922, in the Bishop Museum. These 345 and 371 mm. I also examined 26 others at the same time. All had the horns well developed, though variable. Caudal pale, rounded or slightly double convex behind, without filament and hind edge dusky. Body with many dark dots, in smaller specimens forming very numerous vertical parallel lines as in *Naso eoume*. Some dark dots also form dark lines and bars on head above and on horn. In larger specimens spots absent from moderate area well above pectoral fin and equal to its length. Dorsal and anal uniform brownish, but with narrow inconspicuous dusky edge. Several bluish shades about edge of gill opening and below pectoral, where also some pale spots. In the National Museum 2 Tuamotus, 4 Rangiroa, and 1 Honolulu, also 4 labeled Hawaiian islands. Both these last 2 specimens uniform and without dark vertical lines. The Agassiz Museum has 3 from Ebon Island, obtained by Rev. B. G. Snow.

Günther's figure shows very large irregular bars of blue on the sides, different from my smaller specimen, as they are greatly wider and the markings are altogether fewer.

Mauritius, Ceylon, East Indies, Melanesia, Micronesia, Polynesia, Hawaii.

Naso brachycentron (Valenciennes).

Naseus brachycentron Valenciennes: Hist. nat. Poiss., vol. 10, p. 203, 1835 (type loc., Waigiu).

D. V, 29; A. II, 28. Snout elongate, frontal horn with axis passing through orbit. Scales rather coarse and rough. Each side of caudal peduncle 2 rather large spinous bucklers. Dorsal spines strong, half as high as in *Naso unicornis*. Uniform gray. Length 512 mm. (Valenciennes)

Naso unicornis (Forskål).

Chaetodon unicornis Forskål: Descriptiones animalium, pp. XIII, 63, 1775 (type loc., Djedda, Red Sea).

Naseus unicornis Günther: Cat. fishes Brit. Mus., vol. 3, p. 348, 1861 (Aneiteum).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 30, 1874 (Samoa; Tahiti).—Günther: Mus. Godeffroy, Jour., vol. 4, p. 118, pl. 78, figs. 1-4 in text, 1875 (Huahine; Tahiti).—Streets: U. S. Nat. Mus., Bull. 7, p. 68, 1877 (Honolulu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 355, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 266, 1883 (Hood Bay, New Guinea).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 495,

1901 (Honolulu; Laysan).—Waite: Australian Mus., Records, vol. 5, p. 3, 1903 (Nauru, Pleasant Island, Marshalls).

Naso unicornis Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 67, 1922 (Honolulu).

Monoceros unicornis Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 513, 1900 (Hawaii).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 20, 21, 1902 (Honolulu).

Acanthurus unicornis Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 481, 1902 (1903) (Honolulu).—Snyder: op. cit., p. 534, 1902 (1904) (Honolulu; Puako Bay).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 402, 1903 (1905) (Honolulu; Hilo).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 67, 1906 (Tahiti; Raiatea).—Jordan and Seale: Bur. Fish., Bull., vol. 25, p. 357, 1905 (1906) (Apia).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 13, 28, 1925 (Guam; Honolulu).—Fowler and Bean: U. S. Nat. Mus., Proc., vol. 71, p. 14, 1927 (Tahiti).

Naseus fronticornis (Commerson) Valenciennes: Hist. nat. Poiss., vol. 10, p. 191, 1835 (Waigiu; Tahiti, Carolines, Guam, Hawaiian islands).

Naseus olivaceus Valenciennes: Hist. nat. Poiss., vol. 10, p. 212, 1835 (Tahiti).

Chaetodon olivaceus (Solander) Valenciennes: Hist. nat. Poiss., vol. 10, p. 212 (name in synonymy).

Harpurus monoceros (Forster) Lichtenstein: Descriptiones animalium, p. 219, 1844 (type loc., Tahiti; Babaayoo near Waigiu).

Naseus punikar Thiollière: Fauna Woodlark, p. 182, 1857 (type loc., Woodlark Island).

Prionurus punikar (Montrouzier) Thiollière: Fauna Woodlark, p. 182, 1857 (name in synonymy).

Keris amboinensis Schmeltz: Mus. Godeffroy, Cat. 5, p. 30, 1874 (Upolu).—Schmeltz: op. cit., Cat. 6, p. 15, 1877 (Yap).

Keris maculatus (Kner) Schmeltz: Mus. Godeffroy, Cat. 5, p. 30, 1875 (type loc., South Sea [name only]).

Monoceros marginatus (non Valenciennes) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 114, 1900 (1901) (Agaña, Guam).

Head 3 1/3 to 3 3/4; depth 1 7/8 to 2 1/4; D. VI, 28, 1 to 30, 1; A. II, 27, 1 to 29, 1; snout 1 1/6 to 1 2/3 in head; eye 3 to 6; maxillary 3 2/5 to 4 1/3; interorbital 3 1/8 to 3 1/2. Least depth of caudal peduncle 5 2/5 in head. Head width 2 to 2 1/3 in its length. Horn along lower edge, 1 1/5 to 2 3/4 in snout, in adult. First dorsal spine 2 1/4 in head; fifth dorsal ray 1 7/8; second anal spine 3 1/2; seventh anal ray 2 1/2; caudal to ends of median rays 1 7/8; pectoral 1 2/3; ventral 2.

Dried examples and old alcoholics dull uniform brown. The three young with usually median brown longitudinal band on anal. Half-grown with 2 or 3 such lines on anal, though on dorsal oblique brown lines as in Günther's figure represented blue. The 3 young without any trace of frontal horn.

In the Academy 7 Hawaiian specimens, of which 2 from Oahu through W. H. Jones and the others from J. K. Townsend. Largest 425 mm. The Bishop Museum has 9 from Honolulu, 5 from Agaña on Guam, 2 Tahiti, 1 Rarotonga, 2 Raiatea, 2 Tubuai. Largest 583 mm. I found 205 specimens in the Honolulu markets during November and December 1922 and January 1923. Also 3 from Guam in 1923. The National Museum has 1 from Oahu, obtained by the Wilkes Expedition. Also 2 from Samoa and 12 from the Hawaiian islands, of which 8 from Honolulu. In the Agassiz Museum adult from Honolulu through W. H. Jones and 12 Society Islands through Andrew Garrett.

Keris amboinenis Bleeker (Nat. Tijds. Ned. Ind., vol. 3, p. 272, 1852, type loc., Amboina; Wahai) is evidently the young. Jouan describes one from Port de France, New Caledonia, as *Theutis* No. 86 (Soc. Cherbourg, Mem., vol. 8, p. 299, 1861): D. V, 24; A. II, 27; V. I, 3. Body oval, depth 2. Skin rough. Caudal forked. Whitish, head back and part of abdomen blue-black. Length 140 mm.

Red Sea, Mauritius, Bourbon, Ceylon, East Indies, Japan, Queensland, Melanesia, Micronesia, Polynesia, Hawaii.

Naso hexacanthus (Bleeker) (Pl. XXXIV, *A*).

Priodon hexacanthus Bleeker: Nat. Tijds. Ned. Indie, vol. 8, p. (393) 421, 1855 (type loc., Amboina).—Günther: Cat. fishes Brit. Mus., vol. 3, p. 335, 1861 (copied).

Callicanthus metoposophron Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 481, fig. 31, 1902 (1903) (type loc., Honolulu).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 8, p. 125, 1904 (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 405, fig. 178, 1903 (1905) (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 67, 1922 (Honolulu).

Acanthurus metoprosophron Fowler: B. P. Bishop Mus., Bull. 22, p. 13, 1925 (Guam).

Acanthurus tuberosus (non Lacépède) Fowler: B. P. Bishop Mus., Bull. 22, p. 28, 1925 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 38, p. 21, 1927 (Honolulu).

Head 4 2/5; depth 3; D. VI, 26; A. II, 26; snout 1 3/5 in head measured from its own tip; eye 5; maxillary 5; interorbital 2 1/2. Least depth of caudal peduncle 6 in head. Head width 2 in its length. First dorsal spine 3 1/8 in head; first dorsal ray 3 1/4; second anal spine 3 3/4; fifth anal ray 3 1/8; caudal, to tips of median rays, 2 1/4; pectoral 1 2/3; ventral 2 3/5.

Known by its uniform gray brown color. In the young the dorsals have 4 black longitudinal bands, interspaces pale, and with age clouded darker or become uniformly dusky. Anals always uniform, but dusky with age. Reaches 700 mm.

The Bishop Museum has 3 adults, largest 588 mm. and 2 smaller, all from Honolulu. I found a single small specimen in the Honolulu market December 19, 1922. This species only came to Thompson's notice in recent years, or since 1915. Besides the above he found 5 specimens, one of which 710 mm. long. Also 8 from Guam in 1923. In the National Museum the type of *Callicanthus metoposophron*.

My smaller Honolulu specimens in most respects with the variegated color-pattern of *Aspisurus carolinarum*. The dark or blotched ventrals are present in all the specimens. None have fine spots, also the spots do not extend so low or in such profusion, besides the frontal hump or convexity is scarcely projected.

East Indies, Micronesia, Hawaii.

SIGANIDAE

Siganus javus (Linné).

Teuthis javus Linné: Systema nat., 12th ed., p. 507, 1766 (type loc., Java).

Amphacanthus javus Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 126, 1913 (Beo. Majalibit Bay, Waigiu).

Siganus rivulatus Fowler and Bean: U. S. Nat. Mus., Proc., vol. 71, p. 14, 1927 (Tahiti).

Head 3 1/2; depth 2 1/3; D. XIII, 10; A. VII, 9; snout 2 1/2 in head; eye 3, 1 1/5 in snout. Upper profile of snout little convex. Caudal emarginate. Head, back and sides dark neutral-brown, lighter below. On head and back many pale gray rounded spots, more elongated on sides and abdomen. Fins immaculate. (Day)

Three specimens, 101 to 230 mm., in the National Museum, from New Guinea. Two specimens in the National Museum from Tahiti; larger, 130 mm.

India, East Indies, Queensland.

Siganus canaliculatus (Mungo Park).

Chaetodon canaliculatus Mungo Park: Linn. Soc. London, Trans., vol. 3, p. 33, 1797 (type loc., Sumatra).

Amphacanthus margaritiferus Valenciennes: Hist. nat. Poiss., vol. 10, p. 106, 1835 (type loc., Amboina; Vanicolo).—Schlegel and Müller: Nat. Ges. Zool., Verhand., p. 10, 1839-1844 (Vanikoro).

Teuthis margaritifera Peters: Akad. Wiss. Berlin, Monatsb., p. 835, 1876 (1877) (New Britain).—Günther: Rept. voyage "Challenger," vol. 1, p. 56, 1880 (Nares Harbor, Admiralty Islands).

Depth little over 3 in total; D. XIII, 10; A. VII, 9. Snout profile nearly straight. Eye 3 in head. Caudal emarginate, lobes pointed. When fresh dull greenish above, flanks grayish, below straw-white, tinged silvery. Everywhere with bluish dots. Dorsal and caudal dull greenish. Pectoral greenish yellow. Length 178 to 228 mm. (Valenciennes)

Seychelles, East Indies, Melanesia.

Siganus concatenatus (Valenciennes).

Amphacanthus concatenatus Valenciennes: Hist. nat. Poiss., vol. 10, p. 93, 1835 (type loc., Buru; Batavia).

Teuthis concatenata Schmeltz: Mus. Godeffroy, Cat. 4, p. 20, 1869 (Pelew Islands).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 88, 1874 (Pelew Islands).—Günther: Rept. voyage "Challenger," vol. 1, p. 56, 1880 (Nares Harbor, Admiralty Islands).

Teuthys concatenatus Castelnau: Zool. Acclim. Soc. Victoria, Proc., vol. 2, p. 114, 1873 (Noumea, New Caledonia).

Head 4 in total; depth 2 1/2; D. XIII, 10; A. VII, 9. Forehead convex between eyes, falls nearly vertical. Gray-blue, silvery below. Back with rounded oval blotches of yellowish bordered brown, blotches more oblong below, on flanks as interrupted chains or bands. On cheek and opercle 2 or 3 undulated blue lines bordered brown. Some brown dots on vertical fins, on caudal very regular on rays. Pectoral grayish-yellow. Ventral whitish. Length 152 mm. (Valenciennes)

One in the National Museum from New Guinea.

Andamans, East Indies, Micronesia, Melanesia.

Siganus corallinus (Valenciennes).

Amphacanthus corallinus Valenciennes: Hist. nat. Poiss., vol. 10, p. 101, 1835 (type loc., Seychelles; Java).

Teuthis corallina Schmeltz: Mus. Godeffroy, Cat. 4, p. 20, 1869 (Pelew Islands).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 88, 1874 (Pelew Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 249, 1882 (New Guinea).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 22, 1885 (Rubi, New Guinea).

Teuthis studeri Peters: Akad. Wiss. Berlin, Monatsb., p. 834, 1876 (1877) (type loc., New Britain).

Head 3 2/3; depth 2 1/4; D. XIII, 10; A. VII, 9; snout 1 3/4 in head, upper profile concave; eye 4 1/2, 2 1/2 in snout. Soft dorsal and anal little triangular behind. Caudal widely forked. Pectoral broad, little less than head. Orange. Small sky-blue dots on trunk, tail, bases of caudal and anal, each dot much less than interspaces; on head, breast and thorax larger blue spots, numerous and close-set. Length 265 mm. (Schlegel and Müller)

Teuthis studeri is evidently a variant in which the blue ocelli are larger on the body than usual or equal the light interspaces.

Seychelles, East Indies, Melanesia, Micronesia.

Siganus vermiculatus (Valenciennes).

Amphacanthus vermiculatus (Kuhl and Van Hasselt) Valenciennes: Hist. nat. Poiss., vol. 10, p. 92, 1835 (type loc., New Guinea; Java; Mauritius).

Teuthis vermiculata Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 20, 1869 (Kandavu).—Jouan: Soc. Cherbourg, Mem., vol. 21, p. 334, 1877-78 (on *Theutis* Jouan: op. cit. vol. 8, p. 298, 1861, Baie du Sud, New Caledonia).—Günther: Rept. voyage "Challenger," vol. 1, p. 56, 1880 (Nares Harbor, Admiralty Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 249, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 265, 1883 (fresh water of Normanby Island, New Guinea).

Siganus shortlandensis Seale: B. P. Bishop Mus. Occ. Papers, vol. 4, no. 1, p. 69, fig. 17, 1906 (type loc. Shortland Island, Solomons).

Head 3 1/8 to 3 5/6; depth 2 to 2 1/4; D. XIII, 10, 1 or XIV, 9, 1; A. VII, 9, 1; snout 2 to 2 2/3 in head; eye 2 1/4 to 3 2/5; maxillary 3 2/5 to 3 7/8; interorbital 2 3/4 to 3 1/4.

Body deeply ovoid, greatly compressed, deepest at spinous anal origin. Caudal peduncle strongly compressed, least depth equals its length or 3 1/5 to 4 4/5 in head. Head width 1 7/8 to 2 1/2 in its length. Snout conic, convex, width 1 1/5 to 1 1/3 in its length. Eye large, with front pupil edge midway in head; diameter 1 to 1 2/3 in snout, little greater to 1 1/8 in interorbital. Mouth small, little inferior, lower jaw shorter. Maxillary reaches opposite hind nostril; expansion 2 1/5 to 2 4/5 in eye. Teeth compressed, slender, uniserial, close-set, with large pointed median cusp and small one each side. Front nostril at last 2/5 to midway in snout; hind nostril midway to slightly nearer front one than eye. Interorbital slightly convex. Preopercle flange, opercle and humeral bones all striate. Gill rakers 5 or 6 + 19 or 20, fine, short points, 4 3/5 to 5 in gill filaments, which 1 3/4 in eye. Scales simple, firm, cycloid, oblong; circuli very fine, 70. Scales of occiput extend forward opposite hind eye edge; patch of small postocular scales, close above opercle; cheek covered with patch of rather large scales, about 10 to 15 in transverse series. Lateral line arched, slopes down along upper side of caudal peduncle to middle of caudal base. Fifth dorsal spine 1 9/10 to 2 1/10 in head; second dorsal ray 1 1/5 to 1 1/2; seventh anal spine 1 1/2 to 1 4/5; third anal ray 1 1/4 to 1 1/3; pectoral 1 1/5 to 1 1/3; ventral 1 2/5 to 1 7/8; caudal 3 1/2 to 3 3/4 in combined head and trunk, deeply emarginate, 1 to 1 1/6 in head in young.

Largely dark drab-gray, little paler on sides. Under surface of head, breast and belly whitish. Head, back and most of sides above with fine white dots. Lower

sides with white vermiculating lines. Fins all dull brown, caudal with obscure and slightly darker fine waved crossbars medianly. Pectoral dilute olive. Ventral deep brown.

In young soft dorsal and anal with 3 or 4 longitudinal darker bands. Also young with 5 distinct transverse brownish bands. In the Agassiz Museum 5 specimens from the Marshall Islands. These are 3 young 55 to 77 mm. from Ascension Island through the Rev. A. A. Strong on April 14, 1877 and 2 adults 260 to 295 mm. from Ebon Island through Rev. B. G. Snow in April of 1877. The Bishop Museum has only the type of *Siganus shortlandensis,* 292 mm. long. Although its color-pattern is now obscure it still shows much of the general character of Schlegel and Müller's figure of *Amphacanthus vermicularis* and *Teuthis vermiculata* Day. It seems closely related to *Siganus lineatus,* differing in its spotted soft vertical fins and larger eye.

Mauritius, East Indies, Philippines, Queensland, Melanesia, Micronesia, Polynesia.

Siganus sutor (Valenciennes) (fig. 50).

Amphacanthus sutor Valenciennes: Hist. nat. Poiss., vol. 10, p. 108, 1835 (type loc., Seychelles; Bourbon; Malabar).

Siganus sutor Fowler: B. P. Bishop Mus., Bull. 22, p. 13, 1925 (Guam).

Head 3 to 3 1/3; depth 2 1/10 to 2 1/5; D. XIII, 10; A. VII, 9; snout 2 1/8 to 2 2/5 in head; eye 2 7/8 to 3; maxillary 3 1/2 to 3 3/4; interorbital 3 to 3 1/8.

Body strongly compressed, deeply ellipsoid. Caudal peduncle strongly compressed, least depth 1 to 1 1/8 in its length or 3 7/8 to 4 4/5 in head. Head width 2 1/6 to 2 1/5 its length. Snout convex over surface, compressed, width 1 1/2 to 1 3/4 in its length. Eye large, center slightly behind middle in head length; diameter 1 to 1 1/2 in snout, greater than interorbital. Mouth small, lower jaw included. Maxillary reaches hind nostril, little short of same in young; expansion 2 1/3 in eye. Teeth uniserial, closely crowded, tip of each sharp point. Nostrils separated, alike; front one at last 2/5 in snout length; hind one higher, about 3 times longer and midway between anterior and eye. Interorbital broadly convex. Opercle and preopercle flange with few striae. Gill rakers 20 short flexible points, 5 in gill filaments, which 1 4/5 in eye.

Scales cycloid, very small, oblong, with very fine circuli. Tubes 41 in lateral line to caudal base. Third dorsal spine 1 3/4 to 1 7/8 in head; fourth dorsal ray 1 2/3 to 1 7/8; third anal spine 1 3/4 to 1 7/8, third ray 1 3/4 to 1 4/5; caudal 1 to 1 1/3, well forked; pectoral 1 1/6 to 1 1/3; ventral 1 2/5 to 1 2/3.

General tint slate-gray to heliotrope-purple generally, little more grayish on belly. Head and body everywhere with small crowded rings of slaty, often on lower side of head and belly centers pale. Round black blotch, little larger than eye, at shoulder or beginning of lateral line. Spinous fins grayish, mottled with purple-gray and neutral. Soft vertical fins paler terminally and both soft dorsal and anal with transverse darker streaks, each bordered with dark line. Pectoral pale olive. Ventral grayish basally, neutral-tint terminally with several large slate-black blotches. Iris pearl-gray. Length 49 to 115 mm.

In the Bishop Museum 3 specimens from Guam in 1923. Not previously reported from Oceania.

Jouan describes it from Port de France, New Caledonia, as *Theutis* No. 84 (Soc. Cherbourg, Mem., vol. 8, p. 297, 1861): D. XIII, 10; A. VII, 9. Oval, compressed, depth 2 3/4. Eye equals interorbital. Caudal crescentic. Grayish, white below, dotted with white and black. Each side, nearer head than tail, large, dark diffuse blotch. Length 260 mm.

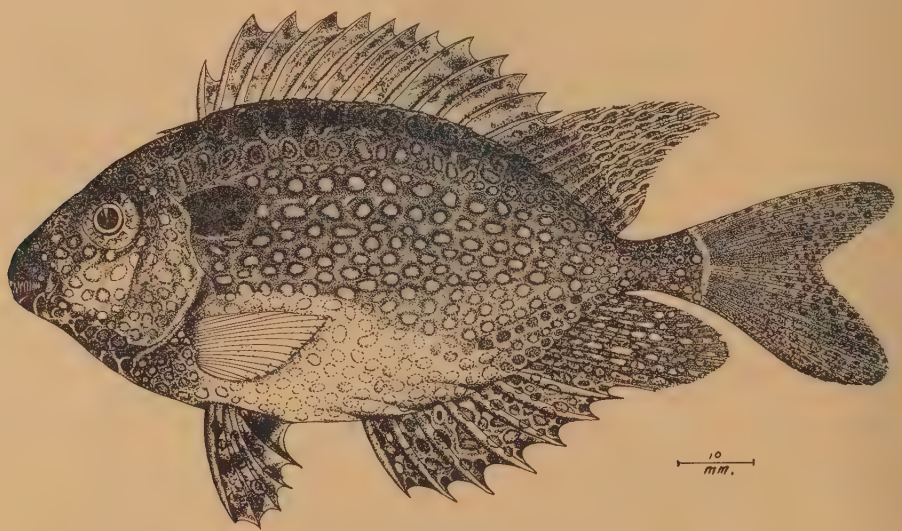

FIGURE 50.—Drawing of *Siganus sutor.*

Siganus tumifrons (Valenciennes).

Amphacanthus tumifrons Valenciennes: Hist. nat. Poiss., vol. 10, p. 117, 1835 (type loc., Baie des Chiens-Marins, West Australia).

Teuthis tumifrons Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 249, 1882 (New Guinea).

Depth 3 1/2 in total; D. XIII, 10; A. VII, 9. Snout slightly longer than eye, convex, somewhat wide. Caudal

emarginate. Brown above, silvery-gray below. Everywhere small bluish or whitish dots, extending on dorsal and anal. Caudal brown. Pectoral yellowish. Ventral brown and white. Length 153 mm. (Valenciennes)

Siganus albopunctatus (Schlegel).

Amphacanthus albopunctatus Schlegel: Fauna Japonica, Poiss., pts. 7-9, p. 128, 1845 (type loc., Nagasaki Bay, Japan).

Head 3 1/4; depth 2; D. XIII, 10, 1; A. VII, 9, 1; snout 2 1/5 in head; eye 3; maxillary 3 1/2; interorbital 3.

Body deeply ovoid, well compressed. Caudal peduncle slender, compressed, least depth 3/4 its length or 2 3/4 in head. Head width 2 in its length. Snout compressed, convex, width 1 1/3 in its length. Eye high, front pupil edge slightly before middle in head length; diameter 1 1/3 in snout, 1 1/8 in antero-interorbital. Mouth small, lower jaw slightly shorter. Maxillary reaches opposite hind nostril, expansion slightly less than pupil. Teeth compressed, pointed, uniserial. Front nostril slightly behind middle in snout length; hind nostril little nearer front one than eye. Interorbital broadly convex. Antero-supraorbital ridge minutely dentate. Opercle with few striae. Gill rakers 8 + 16, short, weak filaments, about 1/5 of gill rakers, which 1 2/3 in eye. Scales firm, small, imbedded. Head naked, except cheek, which covered with fine scales. Third dorsal spine 1 5/6 in head; fourth dorsal ray 1 1/2; third anal spine 1 4/5; third anal ray 1 1/2; caudal 1, emarginate; pectoral 1 1/6; ventral 1 1/2.

Largely dull brown, with scattered pale grayish rounded spots, each separated by space equal to at least their diameters, which not greater than pupil. Fins all brownish. Ovate dusky blotch at shoulder close below beginning of lateral line, with blue-gray border-line, though traces of pale spots within its area and its longitudinal diameter little greater than eye. Iris pale. Length 90 mm.

In the Agassiz Museum 1 from Ponapé, Caroline Islands. It agrees with Günther's description, except the depth given as 3 1/2 in the total length, whereas my specimens show but 2 1/2. This is evidently a condition of age.

East Indies, China, Philippines, Japan, Micronesia.

Siganus spinus (Linné).

Sparus spinus Linné: Syst. Nat., 10th ed., p. 281, 1758 (type loc., East Indies).

Amphacanthus marmoratus Quoy and Gaimard: Voyage "Uranie," Zool., p. 367, pl. 62, figs. 1-2, 1825 (type loc., Guam).—Valenciennes: Hist. nat. Poiss., vol. 10, p. 90, 1835 (Mariannes).—Schlegel and Müller: Verhand. Nat. Ges., Zool., p. 11, 1839-1844 (Marianne Islands).—Kner: Reise "Novara," Fische, vol. 1, p. 207, 1865 (Tahiti).

Teuthis marmorata Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 90, 1874 (Carolines).—Peters: Akad. Wiss. Berlin, Monatsb., p. 835, 1876, 1877) (New Hannover; New Britain).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 38, 1878 (New Guinea).—Günther: Rept. voyage "Challenger," vol. 1, p. 35, 1880 (Kandavu, Fiji).

Siganas marmoratus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 111, 1900 (Agaña, Guam).

Siganus marmoratus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 71, 1906 (Faté).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 359, 1905 (1906) (Apia; Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 22, p. 13, 1925 (Guam).

Amphacanthus guamensis Valenciennes: Hist. nat. Poiss., vol. 10, p. 120, 1840 (type loc., Guam).

Teuthis striolata Günther: Cat. fishes Brit. Mus., vol. 3, p. 319, 1861 (type loc., Aneiteum, New Hebrides).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 20, 1869 (Kandavu).—Günther: Cruise of "Curacoa" (Brenchley), p. 410, 1873 (Solomons).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 89, pl. 59, fig. A, 1874 (New Hebrides; Solomons; Samoa; Friendly Islands; Society Islands).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1394, 1906 (Upolu).

Siganus striolatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 69, 1906 (Raiatea).

Amphacanthus striolatus Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 126, 1913 (Saonek, Waigiu).

Siganus rostratus (non Valenciennes) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 68, 1906 (Shortland Island).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 360, 1905 (1906) (Apia).

Head 3 2/3 to 4; depth 2 1/4 to 2 5/6; D. XIII, 10, 1; A. VII, 9, 1; snout 2 2/5 to 2 3/4 in head; eye 3 1/4 to 3 2/5; maxillary 3 1/3 to 3 3/5; interorbital 3 to 3 1/8. Least depth of caudal peduncle 4 in head. Head width 1 9/10 to 2 in its length. Cheek with 12 rows of scales. First dorsal spine 2 3/5 to 2 2/3 in head; thirteenth 2 2/3 to 2 3/4; first anal spine 2 2/5 to 2 3/5; seventh 2 1/10 to 2 2/5; second dorsal ray 1 1/2 to 1 4/5; second anal ray 2 to 2 1/10; caudal 1 1/10 to 1 1/5; pectoral 1 1/8 to 1 1/4; ventral 1 2/5 to 1 3/5. In the young the pale lines are less numerous, therefore more curved. Caudal base deep brown, fins otherwise pale. In adult soft dorsal and anal, and caudal, rather finely spotted with darker.

The Bishop Museum has 2 from Agaña on Guam, 1 from Raiatea, and 1 from Shortland Island, 76 to 240 mm. Also 13 from Guam in 1923. The National Museum has 4 from Fiji and 1 without locality, 85 to 150 mm., obtained by the Wilkes Expedition; also 7 specimens through the Bureau of Fisheries from Apia, of which 3 as *Siganus rostratus*. One adult in the Agassiz Museum from the Society Islands through Andrew Garrett.

I can find little to distinguish the nominal *Teuthis striolata,* doubtless the same species.

India, East Indies, Micronesia, Melanesia, Polynesia.

Siganus punctatus (Schneider).

Amphacanthus punctatus Schneider: Systema. ichth., Bloch, p. 210, 1801 (type loc., Pacific Ocean [Tonga and New Caledonia]; on Forster).—Valenciennes: Hist. nat. Poiss., vol. 10, p. 107, 1835 (Pacific Ocean).

Teuthys punctatus Castelnau: Zool. Acclimat. Soc. Victoria, Proc., vol. 2, p. 115, 1873 (Noumea, New Caledonia).

Siganus punctatus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 360, 1905 (1906) (Apia; Pago Pago).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 313, 1911 (Makemo, Paumotus; Arhno, Marshalls).

Harpurus inermis (Forster) Lichtenstein: Descriptiones animalium, p. 286, 1844 (type loc., Nanock Island, New Caledonia).

Teuthis hexagonata Günther: Cat. fishes Brit. Mus., vol. 3, p. 320, 1861 (Fiji).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 89, 1874 (Fiji; Samoa).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 15, 1877 (Ponapé).—Günther: Rept. voyage "Challenger," vol. 1, p. 35, 1880 (Kandavu, Fiji).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 22, 1885 (Rubi, New Guinea).

Siganus hexagonata Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 111, 1900 (Agaña, Guam).

Head 4; depth 2 1/5; D. XIII, 10, 1; A. VII, 9, 1; snout 2 in head; eye 4; maxillary 3 3/4; interorbital 3. Least depth of caudal peduncle 3 in head. Head width 2 2/5 in its length. Snout compressed, width 1 1/2 in its length. Teeth slender, rather compressed, pointed, tricuspid, or with median cusp greatly larger than obscure laterals. Cheek with 18 rows of scales. First dorsal spine 3 1/4 in head; fourth 1 9/10; thirteenth 2; fourth dorsal ray 1 2/3; first anal spine 2 3/5; seventh anal spine 1 3/4; first anal ray 1 4/5; caudal measured to tips of median rays 1 1/5; pectoral 1 1/5; ventral 1 3/5.

Dull chocolate-brown generally. Body and head everywhere with very numerous close-set small round pale grayish or whitish spots. Fins dull uniform brown, dorsals and anals little darker than others.

One in the Bishop Museum from Agaña, Guam, 324 mm. In the National Museum 3 from Apia and 1 from New Guinea, 260 mm.

East Indies, Melanesia, Micronesia.

Siganus kopsii (Bleeker).

Amphacanthus kopsii Bleeker: Nat. Tijds. Ned. Ind., vol. 2, p. 483, 1851 (type loc., Rio).

Amphacanthus kopsi Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).

Head 5; depth 2 2/3; D. XIII, 9 or 10; A. VII, 9 or 10. Frontal profile convex. Eye 3 in head. Opercle, preopercle and shoulder-girdle not or but little striate. Hind anal spines longer. Caudal truncate. Pectoral shorter than head. Above reddish-green, below silvery-yellowish. Back and sides with silvery or yellow spots. Head deep green above and forward. Fins greenish. Dorsal and anal spines blackish, rays variegated with dusky. Caudal brownish. Length 145 mm. (Bleeker)

East Indies.

Siganus guttatus (Bloch).

Chaetodon guttatus Bloch: Nat. ausländischen Fische, vol. 3, p. 55, pl. 196, 1787 (type loc., Japan).—Lichtenstein: Descriptiones animalium, p. 286, 1844 (Annamooka or Mamuka, Tonga Islands; New Caledonia).

Amphacanthus guttatus Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 91, 1874 (copied).

Depth nearly 3 in total; D. XIII, 10; A. VII, 9; forehead not convex. Caudal deeply forked. Body uniformly brown, sprinkled with deeper brown or blackish spots; spots dense on vertical fins and other fins uniform. Length 305 mm. (Valenciennes)

East Indies, Melanesia, Polynesia.

Siganus stellatus (Forskål).

Scarus stellatus Forskål: Descriptiones animalium, pp. x, 26, 1775 (type loc., Djedda, Red Sea).

Amphacanthus stellatus Kittlitz: Denkw. Reise Mikronesien, vol. 2, p. 65, 1858 (Ualan).

Head 3 1/6; depth 2 1/3; D. XIII, 10, 1; A. VII, 9, 1; snout 2 1/4 in head; eye 2 1/2; interorbital 3 2/5. Body deeply ovoid, well compressed. Caudal peduncle slender, compressed, least depth 4/5 its length or 4 1/3 in head. Head width 3 in its length. Snout conic, compressed, width 1 2/5 in its length. Eye large, elevated, front pupil edge about midway in head length; diameter 1 1/4 in snout, greater than interorbital. Mouth small, lower jaw slightly shorter. Maxillary reaches about midway in snout length; expansion slightly less than pupil. Teeth compressed, slender, pointed, each with slight lateral cusp. Front nostril nearly median in snout length, small simple pore; hind nostril little larger, higher and little nearer eye than front one. Interorbital convex. Antero-orbital edge entire. Opercle and preopercle flange with few striae. Gill rakers 5 + 20, very fine, slender, 1/4 of gill filaments, which 2 in eye. Scales minute, firm, imbedded. Head naked, except cheek, which covered with fine scales. Third dorsal spine 1 5/6 in head; fourth dorsal ray 1 7/8; third anal spine 2; third anal ray 1 4/5; caudal 1 1/8, emarginate; pectoral 1 1/5; ventral 1 2/3.

Color smoke-gray to mouse-gray, head, trunk and tail with indistinct round pale gray spots, on cheek at least larger than interspaces. On trunk some pale vermiculations. Vertical fins dull grayish with crowded darker spots, most distinct on soft ones. Pectoral pale uniform brown. Ventral darker, with dusky blotches. Length 77 mm.

In the Agassiz Museum 1 specimen from Ascension Island by Rev. A. A. Strong, April 14, 1877. It does not show the pale spot at the predorsal, as in Rüppell's figure of *Amphacanthus punctatus* (Atlas Reis. Nord. Afrika, pl. 11, fig. 2, 1828).

Red Sea, Ceylon, Micronesia.

Siganus fuscescens (Houttuyn).

Sparus fuscescens Houttuyn: Hollandsche Maatsch. Haarlem, Verh., vol. 20, p. 324, 1782 (type loc., Japan).

Teuthis fuscescens Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 38, 1878 (New Guinea).

Siganus fuscescens Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 135, 1902 (1903) (Marcus Island).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 313, 1911 (Kusaie, Carolines).—Fowler: B. P. Bishop Mus., Bull. 22, p. 13, 1925 (Guam).

Teuthis albopunctatus (non Schlegel) Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 88, 1874 (Pelew Islands; Howland Island).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 249, 1882 (New Guinea).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1394, 1906 (Upolu).

Siganus rostratus (non Valenciennes) Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 314, 1911 (Suva, Fiji).

Head 4 1/3; depth 2 7/8; D. XIII, 10, 1; A. VII, 9, 1; head width 1 3/4 in its length; least depth of caudal peduncle 3 7/8; first dorsal spine 2 3/5; thirteenth 2 7/8; second dorsal ray 1 3/4; first anal spine 3 1/10; fourth 1 3/5; seventh 2 1/8; second anal ray 2; caudal 1 1/10; pectoral 1 1/6; ventral 1 1/5. Maxillary reaches nearly to hind nostril or 2/3 to eye. About 10 rows of imbedded scales on cheek. Hind caudal edge very slightly concave.

Largely dull or uniform sepia, with very obscure darker cloudings and marblings on back. Fins pale brownish, soft dorsal with 3 rows of very obscure darker spots on rays. Caudal uniform brown. Pectoral and soft anal pale. Ventral clouded with sepia. Iris slaty.

One in the Bishop Museum from Marcus Island, 181 mm. Three from Guam in 1923. In the National Museum 2 from New Guinea, 1 from Samoa through C. H. White, and 1 from Suva as *Siganus rostratus*. The Agassiz Museum also has a half-grown from Kusaie.

Bourbon, East Indies, Queensland, Japan, Micronesia, Polynesia.

Siganus rivulatus (Forskål).

Scarus rivulatus Forskål: Descriptiones animalium, pp. x, 25, 1775 (type loc., Arabia).

Scarus siganus Forskål: Descriptiones animalium, p. 25, 1775 (type loc., Arabia [alternate name for *Scarus rivulatus*]).

Amphacanthus nebulosus Quoy and Gaimard: Voyage "Uranie," Zool., p. 369, 1825 (type loc., Bay of

Sydney at Port Jackson).—Valenciennes: Hist. nat. Poiss., vol. 10, p. 121, 1835 (Timor; Mariannes; Port Jackson).—Schlegel and Müller: Verhand. Nat. Ges. Zool., vol. 2, p. 12, 1839-44 (Polynesia).

Amphacanthus maculosus Quoy and Gaimard: Voyage "Uranie," Zool., p. 370, 1825 (type loc., Bay of Sydney and Port Jackson).

Head 3 2/3; depth 2 2/3; D. XIII, 10; A. VII, 9; snout 2 1/3 in head; eye 3, 1 1/4 in snout, 1 in interorbital. Upper profile of snout convex. Caudal little emarginate. Pectoral 1 2/5 in head. Purplish brown, with nebulous shades. Fins grayish, several darker streaks obliquely on soft dorsal, anal and transversely on caudal. Ventral slightly dusky terminally. Length 150 mm. (Fowler)

Aden, Zanzibar, Mauritius, Ceylon, Queensland, Micronesia.

Siganus rostratus (Valenciennes).

Amphacanthus rostratus Valenciennes: Hist. nat. Poiss., vol. 10, p. 116, 1835 (type loc., Massuah, Red Sea).

Teuthis rostrata Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 89, pl. 60, 1874 (Pelew Islands; Society Islands; Gilbert Islands).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 15, 1877 (Samoa; Huahine).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 250, 1882 (New Guinea).—Waite: Australian Mus., Mem., no. 3, p. 187, 1897 (Funafuti, Ellice Islands).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 146, 1912 (Mangareva).

Siganas rostrata Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 111, 1900 (Guam).

Siganus rostratus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 67, 1906 (Tubuai; Raiatea; Faté; Shortland Island).—Kendall and Radcliffe: op. cit., vol. 35, p. 146, 1912 (Mangareva).—Fowler: B. P. Bishop Mus., Bull. 22, p. 34, 1924 (Samoa).

Amphacanthus punctatus (Ehrenberg) Valenciennes: Hist. nat. Poiss., vol. 10, p. 116, 1835 (name in text).

Teuthis oligostictus Kner: Akad. Wiss. Wien, Sitz., vol. 58, pp. 30, 345, pl. 7, fig. 23, 1868 (type loc., Kanathia, Viti Islands, Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 20, 1869 (Kanathia).

Teuthis vitianus Sauvage: Soc. Philom. Paris, Bull., 7th ser., vol. 6, p. 173, 1882 (type loc., Fiji).

Siganas hexagonatus (non Günther) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 111, 1900 (1901) (Agaña, Guam; part).

Siganus marmoratus (non Quoy and Gaimard) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 71, 1906 (Tahiti).

Siganus fuscescens (non Houttuyn) Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 313, 1911 (Kusaie).

Siganus punctatus (non Schneider) Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 313, 1911 (Makemo, Paumotus).

Head 4 to 4 1/4; depth 2 3/5 to 2 3/4; D XIII, 10, 1; A. VII, 9, 1; snout 2 1/3 to 2 1/2 in head; eye 3 1/4 to 3 3/4; maxillary 3 3/4 to 4; interorbital 3 to 3 1/5.

Body well compressed, elongately ellipsoid, deepest medianly. Caudal peduncle slender, least depth half its length or 4 4/5 to 5 in head. Head width 1 7/8 to 2 in its length. Snout conic, long as wide. Eye little elevated, midway in head length, 1 1/3 to 1 2/5 in snout, 1 1/8 to 1 1/6 in interorbital. Mouth small, lower jaw little inferior. Maxillary reaches opposite hind nostril, expansion 2 1/8 to 2 1/6 in eye. Teeth compressed, pointed, ends slightly notched, uniserial. Front nostril at last 2/5 in snout; hind nostril little nearer front nostril than eye. Interorbital broadly convex. Antero-supraorbital ridge rough. Opercle with few weak striae, stronger on preopercle limb. Gill rakers 7+17, lanceolate, 4 1/2 in gill filaments, which 1 1/4 in eye.

Head mostly naked, only very few small scales on front of cheeks and upper part of opercle. Fourth dorsal spine 1 7/8 in head; first dorsal ray 2 1/5 to 2 1/4; third anal spine 1 7/8 to 2, second anal ray 2 2/5 to 2 5/6; pectoral 1 1/3 to 1 2/5; ventral 1 1/2 to 1 3/5; caudal strongly forked, 3 3/5 to 3 3/4 in combined head and trunk.

Back nearly bone brown, sides and lower surface paler. Head and trunk everywhere vermiculate and leaving pale spots and blotches. Spinous fins more or less clouded with dusky. Soft dorsal, anal and caudal mostly brownish. Pectoral brown. Ventral whitish to grayish, with 3 or 4 deep brown broad transverse cross-bands, variably, though usually second or median broadest.

In the Agassiz Museum 2 from the Society Islands, 178 to 180 mm., through Andrew Garrett. Also 1 from Mangareva. One from Apia in the Academy. The Bishop Museum has 1 from Faté, 1 Tahiti, 6 Agaña on Guam, 1 Tubuai and 1 Raiatea. Largest 346 mm. In the National Museum 3 from Fiji, obtained by the Wilkes Expedition. Others are 1 from Apia, 1 from Mangareva, 1 from Kusaie as *Siganus fuscescens,* 1 from Tuamotus as *Siganus punctatus,* 3 from Fiji by the Wilkes Expedition, 11 Mangareva.

Teuthis oligostictus differs in no important way from *Siganus rostratus.* The few scattered dark spots on the body may be simply a variation. *Teuthis vitianus* seems to be intended for *Siganus rostratus.* It is described as follows: Head 5 in total; depth 3½. Profile of head slightly concave. Caudal very emarginate. Slaty, somewhat dusky on back and body posteriorly. Dorsal with clouded spots anteriorly. Anal with 3 undulated anterior bands. Ventral with 3 transverse bands. Neck with 3 or 4 irregular bands. Length 200 mm.

Red Sea, Zanzibar, Micronesia, Melanesia, Polynesia.

Siganus argenteus (Quoy and Gaimard).

Amphacanthus argenteus Quoy and Gaimard: Voyage "Uranie," Zool., p. 368, pl. 62, fig. 3, 1825 (type loc., Mariannes; Guam).—Valenciennes: Hist. nat. Poiss., vol. 10, p. 118, 1835 (Mariannes; Guam).

Teuthis argentea Günther: Cat. fishes Brit. Mus., vol. 3, p. 322, 1861 (Mariannes).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 90, 1874 (locality ?).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 250, 1882 (New Guinea).

Head 4 1/3; depth 3 4/5; D. XIV, 10; A. VII, 9; snout 2 1/3 in head; eye 4, 1 3/4 in snout. Body elongated, slender. Upper profile of snout slightly concave. Caudal little emarginate. Yellowish-brown above. Fins reddish. Body and cheeks silvery. Length (of figure) 54 mm. (Quoy and Gaimard).

One in the National Museum obtained at Fiji by the Wilkes Expedition.

Siganus lineatus (Valenciennes).

Amphacanthus lineatus Valenciennes: Hist. nat. Poiss., vol. 10, p. 95, pl. 286, 1835 (type loc., Vanicolo; New Guinea).—Schlegel and Müller: Verhand. Nat. Ges.

Zool., p. 11, 1839-1844 (northeast coast New Guinea; Vanikoro).

Siganus vermiculatus (non Valenciennes) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 69, 1906 (Shortland Island).

Head 3 3/4; depth 2; D. XIII, 10, 1; A. VII, 9, 1; snout 2 in head; eye 3 2/3; maxillary 3 3/5; interorbital 3.

Body deeply ovoid, deepest about base of third anal spine; strongly compressed. Least depth of caudal peduncle 3 1/8 in head. Head width 2 in its length. Snout compressed, width 1 1/5 in its length. Eye center slightly behind middle in head length. Maxillary reaches half way to eye, beyond front nostril but not to hind one. Teeth uniserial, compressed, bidentate, one prong much larger. Cheek with 10 rows of scales. First dorsal spine 4 in head; thirteenth 2 1/10; fourth dorsal ray 1 2/5; first anal spine 3 1/3; seventh anal spine 1 3/4; third anal ray 1 2/5; caudal with hind edge slightly emarginate or concave, measured to ends of median rays 1 2/5; pectoral 1 1/6; ventral 1 2/3.

More or less uniform dull sepia, with 12 to 14 longitudinal darker streaks, forward and on back more or less anastomosed. Fins dull or dilute sepia, soft dorsal and soft anal with very obsolete numerous small darker spots, though on caudal much more distinct. Head with 2 dark lines along side of snout and to eye, another parallel to infraorbital edge. Lower side of head with some dark and short lines. Pectoral and ventral pale, also lips.

Jouan describes it from Baie du Sud, New Caledonia, as *Theutis* No. 85 (Soc. Cherbourg, Mem., vol. 8, p. 298, 1861): D. XIII, 10; A. VII, 9. Oval, very compressed, depth 2 2/5. Caudal crescentic. Violaceous, brown on back, with longitudinal and undulate lines on body, alternately blue bands on violet and brown. Brown points on tail. Fins brownish. Length 370 mm.

In the Bishop Museum 1 from Shortland Island 252 mm. and 3 from Faté.

East Indies, Melanesia.

Siganus doliatus (Valenciennes).

Amphacanthus doliatus Valenciennes: Hist. nat. Poiss., vol. 10, p. 96, 1835 (type loc., Buru; Vanicolo).—Schlegel and Müller: Verhand. Nat. Ges. Zool., p. 11, 1839-44 (Vanicolo).—Thiollière: Fauna Woodlark, p. 177, 1857 (Woodlark Island).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).

Teuthis doliata Kner: Reise "Novara," Fische, p. 209, 1865 (Ponapé).—Schmeltz: Mus. Godeffroy Cat. 4, p. 20, 1869 (Viti Islands).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 90, 1874 (New Hebrides; Pelew Islands; Fiji; Ponapé).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 249, 1882 (New Guinea).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 21, 1885 (Rubi, New Guinea).

Siganus doliatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 69, 1906 (Faté, New Hebrides).

? *Sidjan kit* (Montrouzier) Thiollière: Fauna Woodlark, p. 177, 1857 (name in synonymy).

Head 3 3/5; depth 2; D. XIII, 10, 1; A. VII, 9, 1; snout 2 in head; eye 3 2/5; maxillary 3 3/4; interorbital 3. Least depth of caudal peduncle 3 1/3 in head; head width 2 1/8. Snout compressed, width 1 2/5 its length. Maxillary reaches opposite front nostril or half way in snout. Teeth bicuspid, 1 cusp greatly enlarged, compressed, pointed. Cheek with 12 transverse rows of scales. First dorsal spine 4 1/4 in head, thirteenth 2 1/3; fourth dorsal ray 1 3/5; first anal spine 2 4/5, seventh 2; second anal ray 1 2/5; caudal to ends of median rays 1 1/2, fin well emarginate behind, upper lobe slightly longer than head; pectoral 1 1/8; ventral 1 3/5.

Dull brown, with 25 vertical closely parallel darker or dusky lines; forward more or less giving way to vermiculations or short bars, posteriorly replaced by 5 or 6 longitudinal dark bands; lines above pectoral inclined. Chest with several rather broad dark inclined bands. Head with numerous oblique dark lines, above transverse, as over interorbital and snout. Fins dull brownish, soft dorsal and anal with basal deeper brown shades and latter with outer half more or less brownish.

One in the Bishop Museum from Faté, 198 mm. long. The National Museum has 1 from New Guinea, 193 mm. long.

East Indies, Queensland, Melanesia.

Siganus puellus (Schlegel).

Amphacanthus puellus Schlegel: Bijdr. Dierk., vol. 1, p. 39, fig. 2, 1852 (type loc., East Indies).

Teuthis puella Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 91, 1874 (Apamana; Pelew Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 249, 1882 (New Guinea).

Amphacanthus ocularis Thiollière: Fauna Woodlark, p. 178, 1857 (type loc., Woodlark Island).

Siganus zoniceps Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 69, fig. 18, 1906 (type loc., Shortland Island).

Head 3 4/5; depth 2 2/5; D. XIII, 10, 1; A. VII, 9, 1; snout 2 in head; eye 4 1/10; maxillary 3 4/5; interorbital 3 1/5.

Body elongately ovoid, greatly compressed, deepest at spinous dorsal origin. Caudal peduncle strongly compressed, least depth equals its length or 3 1/5 in head. Head width 2 1/4 in its length. Snout compressed, width 1 2/5 in its length, upper profile with slight depression anteriorly. Eye with front edge midway in head length; diameter 2 in snout, 1 1/4 in interorbital. Mouth small, jaws about even. Maxillary reaches 2/5 to eye or opposite front nostril; expansion 2 1/5 in eye. Teeth slender, compressed, uniserial, close-set, with large pointed median cusp and small one each side. Front nostril midway in snout length, small, simple pore; hind nostril short slit little nearer eye than front nostril. Interorbital broadly convex. Preopercle flange, opercle and humeral bones all striate. Gill rakers 3+18, short points, 1/7 of gill filaments, which 1 3/5 in eye.

Scales simple, cycloid, oblong; circuli very fine, about 66. Scales of occiput extend forward opposite middle of eye, also on upper sides of head in postocular. Cheek covered with fine scales to preopercle ridge. Lateral line complete, extends little high along side of caudal peduncle to middle of caudal base. Fourth dorsal spine 2 1/5 in head; fourth dorsal ray 1 3/5; seventh anal spine 1 4/5; second anal ray 1 3/5; pectoral 1 1/4; ventral 1 1/2; caudal deeply emarginate, lobes slender, upper 3 1/5 in combined head and trunk.

Pale brown, slightly more so below. Broad, deeper brown band extends obliquely from side of head above eye posteriorly and obliquely forward across cheek and parallel with snout profile to mandible, meeting its fellow; within its course traces of deep blue spots. Front of head uniform pale brown. All fins uniform pale brown. Length 288 mm.

In the Agassiz Museum 1 from Ebon Island, obtained by Rev. B. G. Snow in April 1877. At present no traces of blue spots and lines on back or head, also second brown band from front of back to base of pectoral, as shown in

Schlegel's figure. In the Bishop Museum the types of *Siganus zoniceps* and 1 specimen from Faté, largest 330 mm.

There is little doubt but that *Amphacanthus ocularis* is the present species. It is based on a specimen 250 mm., with the depth a little over 3 in total length. It is described as yellow with blue longitudinal lines and a brown transverse ocular band.

East Indies, Melanesia, Micronesia.

Siganus virgatus (Valenciennes).

Amphacanthus virgatus Valenciennes: Hist. nat. Poiss., vol. 10, p. 97, 1835 (type loc., Java).

Teuthis virgata Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 38, 1878 (New Guinea).

Head 3 3/4; depth 2 1/5; D. XIII, 10; A. VII, 9; snout 2 in head; eye 3, 1 1/2 in snout, 1 1/4 in interorbital. Upper profile of snout convex. Caudal emarginate. Blue oblique lines and spots on snout. Upper 2/3 of body coppery-yellow, covered with round blue spots and blue lines on head. Brown band, wide as eye, from predorsal through eye till below jaws; second band from sixth and seventh dorsal spines to pectoral base; both bands edged with blue. Fins yellowish. (Day)

Andamans, East Indies, Philippines, China.

Siganus vulpinus (Schlegel).

Amphacanthus vulpinus Schlegel: Bijds. Dierk., vol. 1, p. 38, 1852 (type loc., East Indies).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).—Weber: Siboga Exped., vol. 65, p. 330, 1913 (Atjatuning, west coast New Guinea).

Teuthis vulpinus Günther: Cruise of "Curaçoa," p. 409, 1873 (Solomons).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 91, 1874 (Solomons; Pelew Islands).

Lo vulpinus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 71, fig. 19, 1906 (Alu, Solomons).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 360, fig. 67, 1905 (1906) (Alu).

Head 3 1/5; depth 2 1/10; D. XIII, 10, 1; A. VII, 9, 1; snout 1 7/8 in head; eye 4; maxillary 5; interorbital 3 1/2. Least depth of caudal peduncle 4 in head. Head width 2 1/5 in its length. Teeth small, compressed, pointed, bicuspid, of which 1 cusp greatly larger. Cheek with 10 rows of scales. First dorsal spine 3 1/3 in head; fourth 1 4/5; thirteenth 2; fourth dorsal ray 1 2/3; first anal spine 2 3/5; seventh 2; fourth anal ray 2; caudal 1 1/4; pectoral 1 1/3; ventral 1 1/2.

Dull brown generally, upper half of head, all breast and prepectoral edge black, fins otherwise pale.

One in the Bishop Museum 192 mm. from Shortland Island. Adult in the Agassiz Museum from Ponapé.

East Indies, Melanesia, Micronesia.

SCORPAENIDAE
SCORPAENINAE

Several references to members of *Scorpaenidae* which I am unable to place are as follows:

Scorpaena vaigiensis Quoy and Gaimard: Voyage "Uranie," Zool., p. 324, pl. 58, fig. 1, 1824 (type loc., Waigiu).

Head 2 1/3; depth 2 2/3; D. XIV, 11; A. III, 5; P. 7, VI; scales 35 in lateral series along lateral line, 6 above, 9 below; snout 6 2/3 in head; eye 3 4/5; maxillary 3.

Body elevated. Head large. Eye very large, greater than snout. Jaws about equal. Maxillary reaches about opposite hind pupil edge. Palatines with teeth. Nasal tentacles present, but no supraocular. Head scaly, except muzzle and maxillary. Scales with 8 basal radiating striae. Soft dorsal higher than spinous dorsal. Second anal spine longest, longer than rays, 1 1/2 in head. Caudal rounded behind. Brown, with 3 dark large blotches on side. Spinous dorsal mottled darker. Anal and ventral each with 2 dark transverse bands, pectoral with 3 besides dark spot on scaly base of fin. Length 114 mm. (Quoy and Gaimard)

This species has not been noticed since originally described, the above being compiled from the original description. The dorsal spines are one in excess of the genus *Scorpaenodes* and the presence of palatine teeth is another character not shared by any other members of that genus. Otherwise it appears to agree.

Scorpaena cruenta Richardson, a New Zealand species, is mentioned by Schmeltz (Mus. Godeffroy, Cat. 4, p. 16, 1869) from the South Pacific.

Parascorpaena bandanensis (Bleeker).

Scorpaena bandanensis Bleeker: Nat. Tijds. Ned. Ind., vol. 2, p. 237, 1851 (type loc., Banda Neira).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).—Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).

Parascorpaena bandanensis Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

Scorpaena haplodactylus Günther: Cat. fishes Brit. Mus., vol. 2, p. 117, 1860 (Fiji?).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Samoa; Viti Islands).—Pellegrin: Mus. Hist. Nat., Paris, Bull. 4, p. 229, 1898 (Mariannes).

Head 2 1/4; depth 2 1/2; D. XII, 9 or 10; A. III, 5 or 6; scales 36 in lateral line, 6 or 7 above; snout 3 1/4 in head from snout tip; eye 3 to 4; maxillary 2 1/3. Lower preorbital spine directed backward. Pectoral rays 15 or 16, all simple. Greenish above, below rosy-green to golden, clouded or variegated with brown. Fins variegated with rosy-brown, soft dorsal anal, caudal and pectoral with transverse dark bands. Length 76 mm. (Bleeker)

East Indies, Micronesia, Polynesia.

Scorpaenopsis cirrhosus (Thunberg).

Perca cirrosa Thunberg: Kon. Vet. Akad. Handl. Stockholm, vol. 14, p. 199, pl. 7, lower figure, 1793 (type loc., Japan).

Scorpaena cirrhosa Günther: Cat. fishes Brit. Mus., vol. 2, p. 120, 1860 (Roul Island).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 78, fig. (head above), pl. 54, 1874 (Tahiti and Society Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 265, 1882 (Southeast New Guinea).

Scorpaenopsis oxycephalus Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, pp. 3, 4, 1859 (Doreh, New Guinea).

Head 2 2/5; depth 3; D. XII, 10; A. III, 5 or 6; scales 50 along lateral line, 8 or 9 above; snout 3 in head from snout tip; eye 6; maxillary 2; fourth dorsal spine 3, shorter than postocular region. Head and body with skinny flaps. Reddish, clouded with brown. Fins each with one or several diffuse dusky bands. Length 250 mm. (Bleeker)

Red Sea, East Indies, China, Japan, Polynesia.

Scorpaenopsis novae-guineae (Cuvier).

Scorpaena novae-guineae Cuvier: Hist. nat. Poiss., vol. 4, p. 235, 1829, (type loc., New Guinea).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 148, 1913 (Soanek, Waigiu).

Scorpena novae-guineae Quoy and Gaimard: Voyage "Astrolabe," Zool., vol. 3, p. 687, pl. 11, fig. 1, 1834 (Port Dorhey, New Guinea).

Scorpaenopsis nova-guineae Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

Scorpaenopsis novae-guineae Sauvage: Mus. Hist Nat. Paris, Nouv. Arch., 6th. ser., vol. 1, p. 129, 1878 (type).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 375, 1905 (1906) (Apia).

Like *Scorpaenopsis cirrhosus* in the slight occipital depression but differing in the much larger scales 45 in the lateral line.

Quoy and Gaimard's figure shows a rather slender finely scaled fish, much smaller than *Scorpaenopsis gibbosus,* second and third anal spines equal or 2 1/5 in head from upper jaw tip, the dorsal well elevated or with third spine long as same of anal, though fourth longest. The length is given by Sauvage as 115 mm. and he says the eyes are separated by a space greater than their own diameter. He also admits *Scorpaena papuensis* Cuvier as distinct from *Scorpaena novae-guineae.*

One in the National Museum from Samoa.

India, East Indies, Polynesia. Reaches 195 mm.

Scorpaenopsis cacopsis Jenkins (Pl. XXXIV, *B*).

Scorpaenopsis cacopsis Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 401, figs. 13-14, 1899 (1901) (type loc., Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 4, p. 11, fig. 5, 1901 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 497, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 467, figs. 205, 205a, pl. 71, 1903 (1905) (Honolulu).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 357, 1906 (Tahiti).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 55, December 1922 (Hawaii).

Scorpaenapus cacopsis Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 22, 1902 (Honolulu).

Scorpaena cookii (part) Günther: Mus. Godeffroy, Jour., vol. 3, pl. 4, 1874 (Hawaii).

Scorpaenopsis altirostris Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 628, fig. 244 1903 (1908) (type loc., off southern Molokai in 43 to 73 fathoms).

Head 2 2/5; depth 3 1/5; D. XII, 10; A. III, 5: scales 54 in lateral line to caudal base and 4 more on latter; tubular scales 29 in lateral line to caudal base and 1 more on latter; 9 scales above lateral line to soft dorsal origin, 16 below; 11 predorsal scales; snout 2 2/3 in head measured from upper jaw tip; eye 8 2/5; maxillary 1 7/8; interorbital 5 2/5. Least depth of caudal peduncle 3 3/4 in total head length. Head width 1 2/5 in its length; mandible 1 2/3; first dorsal spine 7 2/5; third dorsal spine 3 1/10; third dorsal ray 2 7/8; second anal spine 3 1/4; second anal ray 2 1/3; caudal 1 4/5; pectoral 1 3/5; ventral 1 4/5.

The Bishop museum has 4 from Honolulu 131 to 486 mm. I found in the Honolulu markets 6 specimens in December 1922. The National Museum has 3 from Hawaii and the type of *Scorpaenopsis cacopsis.* In the Agassiz Museum 1 from Honolulu, obtained by Andrew Garrett, 457 mm.

Scorpaenopsis papuensis (Cuvier).

Scorpaena papuensis Cuvier: Hist. nat. Poiss., vol. 4, p. 236, 1829 (type loc., New Guinea).

Scorpaenopsis papuensis Sauvage: Mus. Hist. Nat. Paris, Nouv. Arch., 6th ser., vol. 1, p. 129, 1878 (type).

According to Sauvage allied with *Scorpaenopsis diabolus* (Cuvier) and *Scorpaenopsis gibbosus* (Schneider) in the deep quadrangular occipital pit. It agrees with the latter in having 40 scales in the lateral line, but differs in having 11 above the lateral line compared with 5 to 7 above.

Scorpaenopsis gibbosus (Schneider).

Scorpaena gibbosa Schneider: Systema ichth., Bloch, p. 192, pl. 44, 1801 (type loc., "America").—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 79, pl. 53. 1874 (Pelew Islands; Society Islands).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 13, 1877 (Pelew Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p 248, 1882 (New Guinea).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 491, 1901 (Honolulu).—Weber: Siboga Exped., vol. 65, p. 494, 1913 (Wunoh Bay, Waigiu).

Scorpaenapus gibbosa Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 18, 1902 (Honolulu).

Scorpaenopsis gibbosa Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 468, 1903 (1905) (Hilo; Honolulu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 375, 1905 (1906) (Apia).

Scorpaenopsis gibbosus Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 55, Dec. 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 11, 27, 1925 (Guam; Honolulu).—Fowler: Copeia, no. 112, Nov. 20, p. 84, 1922 (Hawaii).

Scorpaenopsis diabolus (non Cuvier) Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, pp. 2, 3, 1859 (Doreh, New Guinea).—Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 515, 1900 (Honolulu).

Scorpaena diabolus Kner: Reise "Novara," Fische, vol. 1, p. 117, pl. 6, fig. 1, 1865 (gills) (South Seas ?).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 15, 1869 (Viti Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 265, 1883 (Hood Bay, New Guinea).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma).

Scorpaena cirrhosa (non Thunberg) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 22, 1902 (Honolulu).

Scorpaenopsis catocala Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 201, 1902 (1903) (type loc., Honolulu; Hilo).—Snyder: op. cit., vol. 22, p. 506, 1902 (1904) (Honolulu).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 946, 1904 (Honolulu; Hilo).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, pl. 56, 1903 (1905).

Sebastapistes baillieui (non Vaillant and Sauvage) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 80, 1906 (Nukuhiva, Marquesas Islands).

Head 2 to 2 1/4; depth 2 1/2 to 2 4/5; D. XII, 9, 1; A. III, 5, 1; scales 41 to 44 in lateral line to caudal base and 2 or 3 more on latter; tubular scales 21 to 23 in lateral line to caudal base and 2 more on latter; 5 or 6 scales above lateral line, 13 or 14 below; 8 to 10 predorsal scales; snout 2 7/8 to 3 in head measured from upper jaw tip; eye 6 1/2 to 9 2/5; maxillary 1 3/5 to 1 4/5; interorbital 4 to 4 3/4.

Least depth of caudal peduncle 4 2/5 in total head length. Front nostril with fringed flap. Gill rakers 4+9, low strongly spinescent tubercles. Scales with 6 to 8 basal radiating striae; 25 to 34 strong apical denticles; circuli fine. Fifth dorsal spine 3 2/3 in total head length; first dorsal ray 2 7/8; second anal spine 4; caudal 2 1/10; pectoral 1 2/3; ventral 1 7/8.

Two in the Academy, labeled Pacific Ocean, through J. K. Townsend, 165 to 210 mm. The

Bishop Museum has 18 from Honolulu and 1 from Nukuhiva, largest 300 mm. I found 12 in the Honolulu markets during November and December 1922. Also 3 from Guam in 1923. In the National Museum 2 from Honolulu and 1 from Tuamotus through Whitaker. The Agassiz Museum has 4 from Society Islands and Apiang in the Gilbert Islands, received through Andrew Garrett, 1 from the Marshall Islands through Rev. B. G. Snow, 3 from Ebon Island through Rev. B. G. Snow and 1 from the same locality through Andrew Garrett. Two of the Society Island specimens were obtained November 29, 1861.

According to Günther's figures *Scorpaenopsis gibbosus* differs from *Scorpaenopsis cirrhosus* in its large scales, the latter having 52 to 58. *Scorpaenopsis gibbosus* also has lower dorsal spines, back more elevated forward or with somewhat hunched appearance and a more irregular upper profile. In squamation *Scorpaenopsis cacopsis* agrees with *Scorpaenopsis cirrhosus,* though its chief character as set forth by Jordan and Evermann in their key to Hawaiian species as "interorbital narrow, its width about equal to or less than length of eye" would appear best to apply to Günther's dorsal view of the head of *Scorpaenopsis cirrhosus.* Jordan and Evermann's view of the top of the head of *Scorpaenopsis cacopsis* shows the eye over twcie its own diameter in the interorbital. In my specimens the eye is 2 to 2 1/2 times in the interorbital.

Jouan describes a *Scorpaena* (Soc. Cherbourg, Mem., vol. 9, p. 110, 1863) over 99 mm. from Ti-Naka on the east coast of New Caledonia, likely this species.

The imperfect account of *Scorpoena no* Thiollière (Fauna Woodlark, p. 155, 1857, type loc., Woodlark Island) may pertain to some species of *Scorpaenopsis.* In brief it is as follows:

Depth 3 1/2 in total; D. XII—?; A. II, 7. Body less swollen than in most species. Lower jaw shorter, without flap. Palatine teeth present. Supraorbital tentacles 2. Preopercle with 6 spines, opercular 1, pre orbital 2, postocular 6, maxillary 3, small. Opercles well developed, flap reaches half way between snout tip and caudal base. Dorsals not deeply notched, fourth spine longest, first 3 spines strongest. Caudal rounded behind, also pectoral. Ventral longer than anal. Brown, without spots or bands. Pectoral little variegated. Length 203 mm.

Peloropsis xenops Gilbert.

Peloropsis xenops Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 630, fig. 245, 1903 (1905) (type loc., Avau Channel between Maui and Lanai islands in 32 to 43 fathoms).

Head 2; depth 2 1/4; D. XII, 9; A. III, 5; scales 70 along lateral line, tubes 23, snout 2 3/5 in head from snout tip; eye 4 4/5, 1 7/8 in snout; maxillary 2 in head; interorbital 8 1/2. Body with many skinny flaps. Third dorsal spine 1 2/5 in total head length. Bright vermilion, darkened olive above with small scattered purplish spots, which also on upper half of pectoral. Fins mottled yellowish-white. Flaps and tentacles narrowly edged bright lemon-yellow. Large black blotch below eye, one on opercle and 1 at pectoral base. Length 152 mm. (Gilbert)

Hawaii.

Sebastapistes albobrunneus (Günther).

Scorpaena albo-brunnea Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 77, 1874 (type loc., Pelew Islands).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 13, 1877 (Pelew Islands).

Sebastapistes albobrunneus Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 20, 1925 (Pearl and Hermes Reef).—Fowler: op. cit., Bull. 38, p. 21, 1927 (Christmas and Howland islands).

? Scorpaena laniaria Cuvier: Hist. nat. Poiss., vol. 4, p. 238, 1829 (type loc., Guam).

Sebastapistes coniorta Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 495, fig. 39, 1902 (1903) (type loc., Honolulu).—Snyder: op. cit., vol. 22, p. 536, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23 pt. 1, p. 458, 1903 (1905) (Honolulu; Waikiki).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 54, Dec., 1922 (Hawaii).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 20, 1925 (Pearl and Hermes Reef).

Sebastapistes galactacma Jenkins: U. S. Fish Comm., vol. 22, p. 496, fig. 40, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 459, 1903 (1905) (type; Honolulu; Waikiki).—Jordan and Jordan: op. cit., vol. 10, no. 1, p. 54, Dec., 1922 (Hawaii).

Sebastapistes galactacme Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 315, 1911 (Suva, Fiji).

The Bishop Museum has 16 from Honolulu; 13 from Waikiki through W. A. Bryan in 1912 to 1916 and 2 from C. H. Edmondson in 1922; 4 from Honomuni on Molokai in July 1914 through W. A. Bryan; 2 from Palmyra in 1913 through C. Montague Cooke, Jr., and 7 in 1922 through Thurston and Thaanum. Length 23 to 95 mm. Also 5 from Pearl and Hermes Reef in 1923. The National Museum has the types of *Sebastapistes coniorta* and *Sebastapistes galactacma,* 9 Hawaiian, 1 Suva and 1 Samoa through S. G. Whitmee. In the Agassiz Museum 3 Hawaiian specimens.

Most specimens of this species have no dermal flaps.

Micronesia, Polynesia, Hawaii.

Sebastapistes asperella (Bennett).

Scorpaena asperella Bennett: Zool. Jour., vol. 4, p. 40, 1828 (type loc., Hawaii).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 80, 1874 (type).

Sebastapistes asperella Fowler, B. P. Bishop Mus., Bull. 22, p. 27, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 20, 1925 (Laysan, French Frigates Shoal, Pearl and Hermes Reef, Ocean and Wake islands).—Fowler: op. cit., Bull. 38, p. 21, 1927 (Christmas Island).

Scorpaena strongia Cuvier: Hist. nat. Poiss., vol. 4, p. 237, 1829 (type loc., Oualan or Strong Island, Carolines).

Scorpoena strongia Lesson: Voyage "Coquille," Zool., vol. 1, pt. 2, p. 213, 1830 (Oualan).

Scorpena strongia Quoy and Gaimard: Voyage "Astrolabe," Zool., vol. 3, p. 688, pl. 11, fig. 2, 1834 (Carolines).

Sebastapistes strongia Streets: U. S. Nat. Mus., Bull. 7, p. 62, 1877 (Honolulu).

Sebastapistes strongius Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).

Scorpaena ballieui Sauvage: Rev. Mag. Zool., 3rd ser., vol. 3, p. 278, 1875 (type loc., Hawaiian islands).

Sebastapistes ballieui Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 455, pl. 72, 1903 (1905) (Honolulu; Waikiki; Hilo).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 19, 1925 (Pearl and Hermes Reef).

Sebastapistes corallicola Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 493, fig. 38, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 456, 1903 (1905) (types).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 19, 1925 (Pearl and Hermes Reef and Ocean Island).

Head 2 1/5 to 2 2/5; depth 2 1/2 to 3; D. XII, 10; A. III, 5 or 6; scales 34 to 41 in lateral line to caudal base and 2 or 3 more on latter; pores 17 to 22 in lateral line to caudal base and 1 or 2 more on latter; 5 scales above lateral line to soft dorsal origin, rarely 6 or 7; 10 scales, vary 11 to 13, below lateral line to spinous anal origin; 4 to 6 predorsal scales; snout 3 1/10 to 3 1/2 in head measured from upper jaw tip; eye 3 to 4; maxillary 1 2/3 to 2 4/5; interorbital 5 to 7 1/8.

Hind preopercle edge with 6 spines. Gill rakers IV, 1+4, IV, obtuse or little lanceolate, several larger bifid, all asperous. Scales with 7 to 11 basal radiating striae; 14 to 33 fine numerous apical denticles. Young with cycloid scales and basal radiating striae 5 to 7. Sometimes last dorsal membrane joined with back. Head usually naked. Often no cutaneous flaps or sometimes large flap from hind preorbital spine or well developed supraorbital flap.

Greatly variable in color, some specimens light, others very dark. In preserved specimens often the white reticulations fade more or less or entirely and it is only the dark spots which persist, especially in strong formaline specimens, and these may be only partial.

The Academy has 4 Hawaiian, of which 1 through J. K. Townsend and 2 from Pago Pago. In the Bishop Museum 21 from Honolulu; 3 from Waikiki through W. A. Bryan December 16, 1916, and 1 from C. H. Edmondson; 1 from Honomuni on Molokai by W. A. Bryan in July 1914. Largest specimen 124 mm. Also 2 from Laysan, 1 French Frigates Shoal, 24 Pearl and Hermes Reef, 14 Ocean Island, 3 Wake Island. In the National Museum the type of *Sebastapistes corallicola* and 21 Hawaiian specimens; 1 from Honolulu through T. H. Streets and 2 from the same locality in the Pease Collection. Small Hawaiian specimen in the Agassiz Museum.

The scales on the head in my specimens are present over the greater area. Their presence on the cheeks seems to be variable. One of Jordan and Evermann's specimens agrees with the figure of *Sebastapistes galactacma* in having the cheek naked, though the postocular and opercle above are scaly. *Scorpaena ballieui* Sauvage as figured by its author certainly shows a species with naked head and maxillary and a long supraorbital tentacle. Its formula is given as D. XII, 10; A. III, 5; scales 32 in lateral line, 7 above, 23 below. *Scorpaena dabryi* Sauvage (Mus. Hist. Nat. Paris, Nouv. Arch., 2nd ser., vol. 1, p. 124, pl. 1, fig. 8, 1878, type loc., China) is evidently another synonym; the type 100 mm. long is said to have D. XII, 9; A. III, 5; scales 40. The characters used to distinguish the nominal Hawaiian species of *Sebastapistes* are unsatisfactory and largely superficial. It would even be possible from the above materials to erect species on characters more diverse and extreme than any Jordan and Evermann suggest. I therefore feel that *Scorpaena asperella* Bennett may best be retained as the earliest name for the species. Though Günther gives the soft anal rays as 5, after an examination of the type, Jordan and Evermann quote 8 from Bennett's description. Quoy and Gaimard's figure of *Scorpena strongia* lends additional suggestions in that the head and maxillary are naked and without filaments or flaps. Their specimen is said to have D. XII, 8 and A. III, 7 and measure about 51 mm. The supraorbital tentacles are extremely variable and certainly are developed greatly in some specimens and not at all in others. On some they are only partly developed or even vestigeal, some on one side of the head only, on others the other side may be devoid. The preorbital flap is present in most and well developed, even in the very young. Yet on the presence and absence of these various flaps, without an examination of series individually, carefully and in detail, have authors laid emphasis on specific distinctions. The maxillary is also variable, usually not extending much beyond the middle of the eye.

Micronesia, Polynesia, Hawaii.

Sebastapistes dentatus (Günther).

Scorpaena dentata Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 76, 1874 (type loc., Pelew Islands).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma).

Head 2 1/3; depth 2 3/4; D. XI, I, 9; A. III, 5; scales 45 in lateral line. Eye equals snout, twice width of deeply concave forehead; no pit below eye; supraorbital tentacle equals eye. Mouth little oblique, lower jaw not projecting. Maxillary nearly reaches hind eye edge. Upper jaw with groove, defined anteriorly by small band of teeth, lateral band more widened; front part of mandibular band moderately wide and intact, joined by narrow strip with lateral teeth and anterior teeth with some greatly strong conic teeth in front row; median vomerine teeth on knob; palatine teeth wider, band long as vomerine. Hind preorbital spine long, pointed, only slightly directed forward. Dorsal spines strong, fourth to seventh longest, 2 1/2 in head. Gray-brown, marbled white. Nape black and large blotch each side of tail under end of dorsal. Pectoral axil brownish, with clear spot above. Length 102 mm. (Günther)

Micronesia, Polynesia.

Sebastapistes nuchalis (Günther).

Scorpaena nuchalis Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 76, fig., (head above), 1874 (type loc., Rarotonga).—Günther: Rept. voyage "Challenger," vol. 1, p. 59, 1880 (Honolulu).—Boulenger: Ann. Mag.

Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma).

Head 2 1/2; depth 2 3/4; D. XI, I, 9; A. III, 5; scales 45 in lateral line. Eye equals snout, not quite twice as wide as deeply concave interorbital; no pit below eye; no supraorbital tentacle. Mouth little oblique, lower jaw not protruded. Maxillary reaches opposite hind eye edge. Palatine band of teeth not long as vomerine. Hind preorbital spine oblique, not directed back. Skin flaps moderately developed. Dorsal with fourth to seventh spines longest, 2 1/2 in head. Head and body gray, marbled with brown, below with white dots. Large black blotch on head, not symmetrical on both sides. Black blotch between third to fifth dorsal spines. Pectoral axil with white spots. Length 76 mm. (Günther)

Polynesia, Hawaii.

Sebastapistes bynoensis (Richardson).

Scorpaena bynoensis Richardson: Voyage "Erebus" and "Terror", Ichth., p. 22, pl. 14, figs. 3-5, 1845 (type loc., northwest coast of Australia).—McCulloch: Australian Mus. Records, vol. 15, no. 1, p. 38, 1926 (note).

Sebastapistes bynoensis Whitley: Australian Mus. Records, vol. 16, no. 1, p. 29, 1927 (Samoa; New Hebrides).

Scorpaena tristis Klunzinger: Zool. Bot. Ges. Wien, Verhand., vol. 20, p. 802, 1870 (type loc., Red Sea).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 77, fig. (head above) 1874 (Rarotonga).—Peters: Akad. Wiss. Berlin, Monatsb., p. 834, 1876 (1877) (Fiji).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma).

Sebastapistes tristis Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 315, 1911 (Borabora, Society Islands).—Fowler: B. P. Bishop Mus., Bull. 22, p. 11, 1925 (Guam).

Scorpaena bakeri Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 120, 1900 (type loc., Guam); p. 216 (Honolulu).

Sebastapistes coloratus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 627, fig. 243, 1903 (1905) (type loc., south of Molokai in 43 to 73 fathoms).

Sebastapistes laotale Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 378, fig. 72, 1905 (1906) (type loc., Apia, Samoa).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 124, 1922 (Pago Pago).

Scorpaenopsis laotale Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 314, 1911 (Makemo, Paumotus).

Scorpaena cooki (non Günther) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 79, 1906 (Raiatea).

The National Museum has 4 from Fiji, 35 to 55 mm. long, obtained by the Wilkes Expedition. Also 1 from Borabora and 1 from Makemo through the Bureau of Fisheries. In the Bishop Museum 3 types of *Scorpaena bakeri* 36 to 61 mm. and 3 from Raiatea, also 3 from Agaña on Guam. Largest 64 mm. Also 4 from Guam in 1923. In the Agassiz Museum 5 from Apia.

Red Sea, Micronesia, Polynesia, Hawaii.

Sebastapistes zanzibarensis (Playfair).

Scorpaena zanzibarensis Playfair: Fishes of Zanzibar, p. 47, pl. 8, fig. 2, 1866 (type loc., Zanzibar).—Günther: Rept. voyage "Challenger," vol. 1, p. 34, 1880 Levuka, Fiji).

Head 2 1/4; depth 2 2/3; D. XI, I, 9; A. III, 5; scales 37 in lateral line; snout 3 1/2 in head from snout tip; eye 4 1/2, 1 1/3 in snout; maxillary 2 1/8, reaches opposite hind eye edge. Orbital tentacle equals 1 2/3 eye diameters. Above lateral line 6 scales. Row of filaments along lateral line. Head naked. Fourth dorsal spine 2 4/5 in total head, 1 1/2 in postocular region. Four pectoral rays branched. Brown, marbled darker and lighter. No black spot on dorsal. Caudal with 2 light crossbands. Pectoral axil marbled light brown Length 195 mm. (Playfair)

Zanzibar, Polynesia.

Scorpaenodes guamensis (Quoy and Gaimard).

Scorpaena guamensis Quoy and Gaimard: Voyage "Uranie," Zool., p. 326, 1824 (type loc., Guam).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 74, pl. 56, fig. B, 1874 (Carolines; Samoa; Tonga; Pelew Islands; Society Islands).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 13, 1877 (Vavao, Tonga Islands).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma).

Sebastopsis guamensis Streets: U. S. Nat. Mus., Bull., vol. 7, p. 76, 1877 (Samoa).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 521, 1900 (Tahiti).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1407, 1906 (Upolu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 374, 1905 (1906) (Apia).—McCulloch: Australian Mus., Records, vol. 9, p. 388, 1913 (Samoa; New Hebrides; Tongatabu; Bougainville Island; Duke of York Island).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 124, 1922 (Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 11, 33, 37, 1925 (Guam: Samoa; Tahiti).

Sebastapistes guamensis Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 80, 1906 (Tahiti; Nukuhiva; Faté; Shortland Island).

Sebastes (Sebastopsis) guamensis Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 148, 1913 (Saonek, New Guinea).

? Scorpaena rawakensis Quoy and Gaimard: Voyage "Uranie," Zool., p. 325, 1824 (type loc., Rawak; Waigiu).

Sebastes minutus Cuvier: Hist. nat. Poiss., vol. 4, p. 255, 1829 (type loc., Moluccas; Marianas; Society Islands).

Scorpaenopsis polylepis Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (1860) (Doreh, New Guinea).

Sebastes polylepis Schmeltz: Mus. Godeffroy, Cat. 5, p. 25, 1874 (Kandavu; Samoa).

Sebastopsis polylepis Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

Scorpaena polylepis Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 248, 1882 (New Guinea).

Scorpaena erinacea Garman: Mus. Comp. Zool., Bull., vol. 39, p. 231, pl. 1, fig. 2, 1903 (type loc., Suva reef, Viti Levu, Fiji).

Sebastapistes strongensis (non Cuvier) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 80, 1906 (Faté).

Head 2 1/4 to 2 1/2; depth 2 7/8 to 3; D. XIII, rarely XII or XIV, 8, 1 or 9, 1; A. III, 5, 1, rarely 4, 1; scales 40 to 42 in lateral line to caudal base and 3 more on latter; tubes 14 to 26 in lateral line to caudal base and 1 more on latter; 5 scales above lateral line to soft dorsal origin, 10 or 11 below; 16 to 20 predorsal scales; snout 3 1/4 to 4 in head measured from upper jaw tip; eye 3 to 4; maxillary 2 to 2 1/5; interorbital 6 to 7.

Gill rakers IV or V, 1+6, 1 to 7, II, lanceolate, about half of gill filaments or pupil. Scales with 9 basal radiating striae; fine apical denticles 61 or 62; circuli fine. Sometimes few flaps about head above and on back. Dorsal spines often variable in height, especially last. Second anal spine 1 4/5 to 2 1/3 in total head length.

In the Academy 7 from Tahiti through Andrew Garrett, 5 Apia and 12 Pago Pago. Length 46

to 93 mm. The Bishop Museum has 2 from Shortland Island, 4 Faté and 1 Tahiti. Largest 100 mm. One from Guam in 1923. In the National Museum 2 from Samoa through Steinberger.

Scorpaena rawakensis Quoy and Gaimard is very incompletely described. The type, about 89 mm. long, is said to have D. XIII, 9, A. III, 6, and so far as the short account permits, agrees with *S. guamensis*. *Scorpaena guamensis* is based on a specimen 55 mm. long, with D. XIII, 9 and A. III, 8, the latter likely abnormal or erroneous? *Sebastes minutus* Cuvier is referred to by Sauvage as *Sebastopsis minutus*. The figure, evidently from the type, shows the front half of the fish, the head scaly. The formula is given as D. XIII, 8 or 9; A. III, 5; lateral line 26 scales, this apparently pertaining to the tubes. Sauvage says his material, which is from Tahiti, is not different from *Scorpaena polylepis* Bleeker. Although I have no specimen of the supposed analogue, *Scorpaenodes kelloggi* Jenkins from the Hawaiian islands, none of my specimens in any way approach the arrangement of 4 spines on the hind edge of the preopercle. In several specimens, though in each only on one side of the head, there may be 4 preopercular spines, but the lowest on each is below the angle. On a few the second or median spine is absent. Of the 10 specimens Jordan and Evermann mention, all were less than 50 mm. There are no other characters, apparently, which may suggest specific identity. The Agassiz Museum has the type of *Scorpaena erinacea*. The large blotched coloration seems to be especially characteristic, besides the large deep brown blotch on the opercle.

Red Sea, East Indies, Queensland, Micronesia, Melanesia, Polynesia.

Scorpaenodes kelloggi (Jenkins).

Sebastopsis kelloggi Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 492, fig. 37, 1902 (1903) (type loc., Honolulu).—Snyder: op. cit., vol. 22, p. 535, 1902 (1904) (Honolulu).

Scorpaenodes kelloggi Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 54, Dec., 1922 (Hawaii).

Head 2 1/2; depth 2 4/5; D. XIII, 9; A. III, 5; scales 31 in lateral line, 5 above, 9 below; snout 4 in head from snout tip; eye 3 1/4, little longer than snout; maxillary 2 1/8. Supraorbital flap little shorter than eye. Spinous dorsal lower than soft fin. Second and third anal spines subequal, less than soft rays. Brown, marbled darker. Lower surfaces paler. Fins more or less spotted or barred with darker. Length 50 mm. (Jenkins)

The type is in the National Museum.

Scorpaenodes parvipinnis (Garrett).

Scorpaena parvipinnis Garrett: Cal. Acad. Sci., Proc., p. 105, 1863 (type loc., Hawaiian islands).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 75, pl. 52, fig. D, 1874 (Hawaiian islands; Raiatea).

Sebastopsis parvipennis Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 20, 1902 (Honolulu).

Sebastopsis parvipinnis Snyder: U. S. Fish Comm., Bull., vol. 22, p. 535, 1902 (1904) (Honolulu).

Sebastopsis guamensis (non Quoy and Gaimard) Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 515, 1900 (Hawaiian islands).

Head 2 1/6 to 2 1/5; depth 2 2/5 to 2 3/4; D. XIII, 10; A. III, 5 or 5, 1; scales 37 to 42 in lateral line to caudal base and 3 to 5 more on latter; pores 22 or 23 in lateral line to caudal base and 1 more on latter; 7 scales above lateral line to soft dorsal origin, 10 to 12 below; 38 to 48 predorsal scales; snout 3 3/4 to 4 in head measured from upper jaw tip; eye 3 2/3 to 3 3/4; maxillary 1 5/6 to 1 7/8; interorbital 5 to 6.

Body compressed, back little elevated. Head compressed, width 1 2/3 to 1 3/4 in its total length. Snout length half its width. Hind eye edge midway or little posterior in head length. Maxillary extends to or beyond hind pupil edge, not to hind eye edge; expansion 1 2/5 in eye. Lower jaw slightly protrudes. Bands of minute teeth in jaws and on vomer, none on palatines. Interorbital deeply concave. Hind preopercle edge with 4 spines, lower front one low and little developed. Gill rakers III, 1+6, lanceolate, half of pupil. Scales with 7 basal radiating striae; terminal row or rather long slender apical denticles 20 to 24, sometimes few as 6; circuli fine. Scales on head above and back above lateral line fine, crowded well up on dorsal bases. Fifth dorsal spine 3 1/5 to 3 7/8 in total head length; second anal spine 2 1/10 to 2 1/5; caudal convex behind, 1 3/5 to 2; pectoral 1 3/5 to 1 3/4; ventral 1 2/3 to 1 7/8.

Color in alcohol largely dull brown. Spinous dorsal with few obscure dark basal blotches on membranes, these reflected down back. Soft anal with several dark streaks. Dark transverse bar on pectoral and ventral ends.

One in the Academy from the Hawaiian islands, 60 mm. long. The Bishop Museum has 4 from Honolulu, 2 from Laie on Oahu through C. Montague Cooke, III, in 1916 and 1 from Honomuni on Molokai through W. A. Bryan in July 1914.

This species differs from *Scorpaenodes guamensis* in its well scaled maxillary, smaller scales on head and above, and the apparent absence of any tentacles or filaments.

Polynesia, Hawaii.

Scorpaenodes scabra (Ramsay and Ogilby.)

Sebastes scabra Ramsay and Ogilby: Linn. Soc. New South Wales, Proc., vol. 10, p. 577, 1885 (type loc., Shark Reef, Australia).

Sebastopsis scabra Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 374, fig. 71, 1905 (1906) (Pago Pago; Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 314, 1911 (Borabora, Society Islands; Kusaie, Carolines).—Fowler: B. P. Bishop Mus., Bull. 22, p. 33, 1925 (Samoa).

Scorpaenopsis guamensis (non Quoy and Gaimard) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 121, 1900 (Guam).

Merinthe haplodactyla (non Bleeker) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 79, 1906 (Faté, New Hebrides).

Scorpaenopsis quiescens Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 80, fig. 2, (no. 783), 1906 (type loc., Tahiti).

Head 2 1/4 to 2 2/5; depth 2 2/3 to 2 4/5; D. XIII, 8, 1; A. III, 5, 1; scales 38 to 42 in lateral line to caudal base and 4 to 6 more on latter; tubular scales 22 to 24 in lateral line to caudal base and 2 or 3 more on latter; 6 scales above lateral line, 11 or 12 below, 6 or 7 predorsal; snout 3 3/4 to 4 1/6 in head measured

from upper jaw tip; eye 3 2/3 to 4 1/10; maxillary 2 to 2 1/5; interorbital 6 to 9.

Body ovoid, compressed, deepest at front of spinous dorsal. Caudal peduncle strongly compressed, length 4/5 to 1 in its least depth, which 3 5/6 to 4 1/2 in total head length. Head width 1 3/4 in its length. Snout obtuse, length 2/3 to 3/4 its width. Eye with hind edge slightly behind center in head length; diameter 1 1/5 in snout, much greater than interorbital. Mouth large, lower jaw slightly protruding. Maxillary reaches opposite eye center; expansion 1 1/3 to 1 1/4 in eye. Bands of fine villiform teeth in jaws and on vomer, none on palatines. Front nostril midway in snout length; hind nostril vertical slit, little nearer front nostril than eye. Interorbital concave. Supraocular spines 3, followed by 1 postocular above and 2 each side of occiput, all large; small madian postocular spine; suprascapula with long spine and 1 close before; opercle with 2 spines; suborbital stay of 5 spines, of which last 2 on preopercle edge, below which 2 more spines; small spine above hind nostril and large one above pectoral origin. Gill rakers 5+7, clavate, slightly longer than gill filaments or 2 in eye. Scales with 10 basal radiating striae, apical denticles 32 to 35 and circuli fine. Head scaly, maxillary and muzzle naked. Head and trunk all with small skinny flaps and points. Fifth dorsal spine 2 1/3 to 2 3/4 in head; second dorsal ray 2 1/10 to 2 1/3; second anal spine 1 2/3 to 1 4/5; second anal ray 1 7/8 to 2; caudal 1 1/2 to 1 4/5, convex behind; pectoral 1 1/3 to 1 2/5; ventral 1 3/5 to 1 2/3.

Brown, with 4 transverse dark bands, everywhere mottled with darker. Vertical fins all rather pale terminally, dark colors of trunk invading basal regions; terminal portions with dark waved lines or streaks. Paired fins similar, only ventral more dusky and lines finer and more numerous. Length 50 ? to 63 mm.

In the Agassiz Museum 2 from Apia, Samoa, from the Bureau of Fisheries. Others are 1 from Strong's Island, Carolines, through Rev. B. G. Snow; 1 from Ponapé, Carolines, through Rev. L. H. Gulick; 2 from Ebon Island, Marshalls, through Rev. B. G. Snow; 7 from Apia, Samoa; small example from Kusaie, Carolines. The Bishop Museum has the type of *Scorpaenopsis quiescens,* which has the D. XIII, 8, 1, and not 19 as given by Seale. Also a specimen from Faté and 1 from Tahiti and 1 from Guam. Length 57 to 95 mm. One in the National Museum from Borabora.

Distinguished from *Scorpaenodes guamensis* by the long second anal spine, which I find but little over half the length of the depressed fin in the latter. In *Scorpaenodes scabra* it is nearly as long as the entire depressed anal fin, or even longer, though variable.

Australia, Melanesia, Micronesia, Polynesia.

Merinthe macrocephala (Sauvage) (Pl. XXXIV, *C*).

Sebastes macrocephalus Sauvage: Soc. Philom. Paris, Bull., 7th ser., vol. 6, p. 169, 1882 (type loc., Hawaiian Islands).

Merinthe macrocephala Snyder: U. S. Fish Comm., Bull., vol. 22, p. 535, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 461, pl. 55, 1903 (1905) (Hilo; Waikiki).—Jordan and Snyder: (U. S.) Bur. Fish., Bull., vol. 26, p. 217, 1906 (1907) (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 55, Dec. 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 27, 1925 (Honolulu).

Head 2; depth 2 7/8; D. XII, 10, 1; A. III, 5, 1; scales 49 in lateral line to caudal base and 5 more on latter; tubes 23 in lateral line to caudal base and 2 more on latter; 9 scales above lateral line, 14 below; 17 predorsal scales; snout 3 in head measured from upper jaw tip; eye 6 1/2; maxillary 2 1/10; interorbital 10; orbital tentacle 3 1/8. Least depth of caudal peduncle 4 3/5 in total head length. Head width 2 2/3 in its length; mandible 2 1/10; first dorsal spine 8 1/4; fourth dorsal spine 4 1/2; third dorsal ray 2 4/5; second anal spine 3 3/4; second anal ray 2 2/3; caudal 2; pectoral 1 4/5; ventral 2 1/8.

The Bishop Museum has 4 from Honolulu, 344 to 478 mm. I found 23 specimens, mostly large adults, in December of 1922 and January 1923. One adult in the National Museum from Hilo.

Helicolenus rufescens Gilbert.

Helicolenus rufescens Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 631, fig. 246, 1903 (1905) (type loc., Kauai in 41 to 165 fathoms; off Maui in 78 to 85 fathoms).

Head 2 1/8; depth 2 2/3; D. XII, 9; A. III, 5; scales along lateral line 52, pores 25; snout 3 3/4 in head; eye 3 1/4; maxillary 2 1/5; interorbital 9 3/5. Gill rakers 7 or 8, very short, on lower limb of first arch. Blotched bright vermilion and pearly-white, latter most conspicuous on fins and in pectoral axil. Dusky-brown specks and mottlings scattered on body, dorsal, caudal and pectoral. Length 78 to 105 mm. (Gilbert)

Hawaii.

Pontinus spilistius Gilbert.

Pontinus spilistius Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 633, fig. 247, 1903 (1905) (type loc., off Maui in 95 to 152 fathoms).

Head 2 1/6; depth 2 4/5; D. XII, 10; A. III, 5; scales 55 along lateral line, pores 24; snout 3 1/2 in head; eye 3 3/4; maxillary 2 3/5; interorbital 11. Gill rakers 9, clavate, 1/3 of pupil, on lower branch of first arch. Reddish, with dusky mottlings along back, lighter or reddish blotches at dorsal base. Broad light reddish bar on tail. Snout and top of head finely speckled olive-brown. Black spot between seventh and tenth dorsal spines and small dark spots at bases of some spines and rays. Two small dark spots dividing pectoral base into thirds. Length 90 mm. (Gilbert)

In the National Museum the type.

Plectrogenium nanum Gilbert.

Plectrogenium nanum Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 634, fig. 248, 1903 (1905) (type loc., Laysan Island; off Maui, Kauai, in 143 to 357 fathoms).

Head 2 3/4; depth 4; D. X, 11, 7; A. III, 5; scales 28 in lateral line, 2 above, 7 below; snout 4 3/5 in head; eye 2 4/5; maxillary 3 1/3; interorbital 5. Gill rakers 11 or 12, short, less than third of pupil, on lower branch of first arch. Dorsals deeply divided nearly to base. Uniform rose pink. Dusky streak on membrane behind terminal half of each dorsal spine and dusky blotch at middle of soft dorsal. Length 70 mm. (Gilbert)

The National Museum has 8 paratypes.

Setarches remiger (Gilbert and Cramer).

Scorpaena remigera Gilbert and Cramer: U. S. Nat. Mus., Proc., vol. 19, p. 418, pl. 40, 1897 (type loc., off Hawaiian islands in 298 fathoms).

Setarches remiger Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 634, 1903 (1905) (Pailolo Channel,

Oahu, Laysan, Hawaii, Maui, Kauai, in 97 to 352 fathoms).

Head 2 1/4 to 2 1/3; depth 2 3/4; D. XII, 10; A. III, 5; pores 29 in lateral line, 10 or 11 scales above; snout 3 1/8 in head from snout tip; eye 4 3/5; maxillary 2. Gill rakers 9 or 10, 2 1/2 in eye, on lower branch of first arch. Pectoral very long, nearly reaches bases of last anal rays. Reddish, densely dotted with minute black specks. Spinous dorsal edge, soft dorsal base, basal third of anal, ventrals, median band from ventral roots to anal origin, spot below spinous dorsal and another below soft dorsal and one on caudal peduncle and gill cavities blackish. Length 109 mm. (Gilbert and Cramer)

The National Museum has 1 Hawaiian specimen.

Setarches fidjiensis Günther.

Setarches fidjiensis Günther: Ann. Mag. Nat. Hist. London, 5th ser., vol. 2, p. 179, 1878 (type loc., off Matuka, Fiji Islands, in 315 fathoms).—Günther: Rept. voyage "Challenger," vol. 22, p. 19, pl. 1, fig. C, 1887 (type).

Head 2 1/2; depth 3; D. X, I, 10; A. III, 5; snout 3 2/3 in head; eye 4 1/2, 1 1/2 in snout; maxillary 1 7/8 in head, reaches below middle of eye; interorbital wide as eye, flat. Upper jaw little longer; very narrow bands of villiform teeth in jaws, on vomer and palatines. Largest spines 3 at preopercle angle, smaller ones on preorbital, lower preopercle edge and opercle. Body covered with minute cycloid scales. Lateral line wide. Head scaleless, without prominent scales on vertex and with parallel ridges. Fourth dorsal spine 2 1/2 in head; third anal spine longer than second; pectoral reaches anal. Body irregularly mottled with brown. Length 77 mm. (Günther)

Iracundus signifer Jordan and Evermann.

Iracundus signifer Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 210, 1902 (1903) (type loc., Honolulu).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 126, 1904 (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 470, fig. 207, 1903 (1905) (type; Honolulu).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 387, 1923 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 27, 1925 (Honolulu).

Head 2 1/2; depth 3 2/5 to 3 2/3; D. XI or XII, 9, 1 or 10, 1; A. III, 5, 1; scales 54 in lateral line to caudal base and 4 more on latter; tubular scales 27 in lateral line to caudal base and 1 more on latter; 10 scales above lateral line to soft dorsal origin, about 18? below to anal origin; 12 predorsal scales to occiput; snout 3 2/3 in head measured from upper jaw tip; eye 3 2/3 to 4 2/5; maxillary 2 to 2 1/6; interorbital 6 1/4.

Least depth of caudal peduncle 3 7/8 to 4 in total head length. Head width 2 to 2 1/8 in its length; mandible 1 4/5. Maxillary reaches opposite to eye center or hind pupil edge. Gill rakers VI + 9, VI, short tubercles, about 2/5 of gill filaments, which 1 4/5 in eye. Scales rather caducous, many fallen. Supraorbital flap about long as pupil, absent in young. Head and body with many thin cutaneous flaps, not present in young. First dorsal spine 2 2/5 in head; fourth dorsal spine 1 5/6; seventh dorsal ray 2 1/10; second anal spine 2 3/4; third anal ray 1 4/5; caudal 1 1/2; pectoral 1 2/5; ventral 1 3/4.

Color in alcohol pale brownish generally. Blackish spot on second membrane of spinous dorsal terminally not quite large as eye. Length 112 mm.

The Bishop Museum has 2 from Honolulu, 78 and 112 mm., obtained by J. W. Thompson in 1910. One also obtained from a fish stomach in the Honolulu market, June 16, 1919. A young specimen, 37 mm. in poor condition. The National Museum has the type.

Pterois volitans (Linné).

Gasterosteus volitans Linné: Systema nat., 10th ed., p. 296, 1758 (type loc., Amboina).

Pterois volitans Thiollière: Fauna Woodlark, p. 154, 1857 (Woodlark Island).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 16, 1869 (Samoa).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 81, 1874 (Society Islands; Pelew Islands).—Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 278, 1876 (Hall Sound, New Guinea).—Peters: Akad. Wiss. Berlin, Monatsb., p. 834, 1876 (1877) (New Britain).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 248, 1882 (New Guinea).—DeVis: op. cit., vol. 8, p. 457, 1883 (New Britain).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 379, pl. 51, 1905 (1906) (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 315, 1911 (Jaluit, Marshalls).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 18, p. 206, 1912 (Port Sandwich, New Hebrides).—Fowler: B. P. Bishop Mus., Bull. 22, p. 11, 1925 (Guam).

Pseudomonopterus (*Pterois*) *volitans* Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

Pterois rebel (Montrouzier) Thiollière: Fauna Woodlark, p. 154, 1857 (name in synonymy).

This species may be known by its very small scales, 95 in lateral line and 14 above to median dorsal spines.

The National Museum has 1 from Jaluit, 1 Apia and 1 from Nukuhiva, obtained by W. H. Jones. In the Agassiz Museum 1 from the Society Islands through Andrew Garrett, 1 Kusaie in the Caroline Islands, and 5 from Ebon Island, Marshall Islands, from Rev. B. G. Snow. The Bishop Museum has 1 from Guam secured in 1923.

Red Sea, Zanzibar, Cape of Good Hope, Mauritius, Bourbon, Seychelles, Ceylon, India, Andamans, East Indies, China, Japan, Queensland, Melanesia, Micronesia, Polynesia.

Pterois miles (Bennett).

Scorpaena miles Bennett: Fishes of Ceylon, no pagination, pl. 9, 1828-30 (type loc., Ceylon).

Pterois miles Günther: Cat. fishes Brit. Mus., vol. 2, pp. 125, 520, 1860 (Aneiteum, New Hebrides).

Günther says it is well distinguished by a broad band of erect spines along the infraorbital bones. Rays of soft vertical fins dotted with brown and a series of white dots along lateral line, D. XII, I, 11 or 12. Length 432 mm.

Red Sea, Natal, Ceylon, Melanesia.

Pterois antennata (Bloch).

Scorpaena antennata Bloch: Nat. ausländischen Fische, pt. 3, p. 21, pl. 185, 1787 (no type locality [likely East Indies]).

Pterois antennata Cuvier: Hist. nat. Poiss., vol. 4, p. 265, 1829 (type loc., [Waigiu]).—Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 212, 1830 (Offack Bay, Waigiu).—Jouan: Soc. Cherbourg, Mem., vol. 9, p. 111, 1863 (New Caledonia).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 13, 1877 (Tatuna Island).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 315, 1911 (Makatea, Paumotus).—Fowler and Bean: U. S. Nat. Mus., Proc., vol. 71, p. 15, 1927 (Tahiti).—Fowler: B. P. Bishop Mus., Bull. 38, p. 21, 1927 (Marquesas Islands).

Pterois antennatus Fowler: B. P. Bishop Mus., Bull. 22, p. 11, 1925 (Guam).

Pseudomonopterus (*Pterois*) *antennatus* Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

Head 2 1/2 to 2 3/5; depth 2 2/5 to 2 2/3; D. XII, 11, 1; A. III, 6, 1; scales 49 in lateral line to caudal base and 5 more on latter; 24 to 28 pores in lateral line to caudal base and 1 or 2 more on latter; 9 or 10 scales above lateral line, 12 to 14 below, 6 predorsal; snout 3 to 3 1/4 in head from snout tip; eye 3 2/3 to 4 2/5; maxillary 2 1/8 to 2 2/5; interorbital 4 1/4 to 5.

Body strongly compressed, elongately oval, deepest at middle of spinous dorsal base. Caudal peduncle well compressed, length 7/8 its least depth, which 3 to 3 3/4 in total head length.

Head width 1 3/5 to 1 3/4 in its length. Snout obtuse, long as wide. Eye elevated, greatly impinging on upper profile and hind pupil edge midway in total head length; diameter 1 1/2 in snout, equals or slightly greater than interorbital; supraorbital tentacle 1 1/4 eye diameters, 2 in young, with short filaments. Mouth large, oblique, lower jaw projecting. Maxillary reaches opposite pupil, expansion 1 1/4 to 1 1/2 in eye. Teeth in bands, minute, villiform, in jaws, on vomer and palatines, none on tongue. Nostrils rather large, together, within last fourth of snout, similar; front one with tentacle long as pupil. Interorbital deeply concave.

Spine above internasal septum; 1 at antero-supraorbital ridge, followed posteriorly with series of strong marginal denticles to postocular region; preorbital with strong radiating ridge, with spine at lower front edge of orbit, 2 above maxillary of which lower larger and with broad dermal flap, also group of 4 posterior parallel spines directed downward and backward; suborbital stay with strong short spine; preopercle ridge with 5 erect short spines above 3 broad wide-set marginals; group of 4 inner postocular spines, with close-set pair median; cluster of 5 principal parietal spines with several small ones each side; also ridge of spines with several small ones each side; also ridge of spines from postocular region to suprascapula; 2 broad flaps from below front of preopercle. Gill rakers 5 + 11, clavate, short, 7/8 of gill filaments, which 2 4/5 in eye.

Scales with 9 to 12 basal radiating striae; apical denticles 26 to 37, rather weak, often absent from sides of abdominal scales; circuli fine. Scales adherent, small and more crowded on cheeks, edges of opercles, predorsal, paired fins and caudal bases. Longest dorsal spines fifth to ninth, membranes deeply cleft until only basal 1 3/4 to 2 1/5 in combined head and trunk; fifth dorsal ray 1 1/4 to 1 3/5 in total head length; third anal spine 2 1/2; third anal ray 1 1/5 to 1 1/3; caudal rounded, 1 1/8 to 1 1/4; pectoral with upper rays extended little beyond caudal tip, rays all deeply cleft, membranes only extend beyond basal 2/5 of fin; ventral 2 to 2 1/8 in combined head and body, spine 2 1/2 to 3 in fin.

In alcohol generally pale brownish, more or less whitish below. Broad blackish-brown band, about wide as pupil from supraocular flap to subopercle, followed by postocular dusky-brown band, narrowing on opercle with equally broad remaining band of head from parietals to lower part of opercle. On trunk 8 broad deep brown transverse bands, only first narrow and down on opercle flap, though posterior ones all inclined forward; between each dark band in pale area narrower paler band also in turn separated by brown line, mostly faded out below. Dorsal spines broadly barred with dusky-brown. Soft dorsal, anal and caudal with each ray finely spotted with blackish, though dark body bands reflected on bases. Pectoral with membranes dusky terminally and spotted with blackish, fin pale basally and broad parietal band continued across from head, besides 2 dusky transverse lines. Ventral membranes dusky, with blackish basally.

Two in the Bishop Museum, obtained at Guam in 1923. Length 120 to 163 mm. In the National Museum 1 from Makatea. The Agassiz Museum has 1 from Makatea also 3 from Ebon Island, through Rev. B. G. Snow.

Mauritius, Bourbon, Cochin-China, East Indies, China, Melanesia, Micronesia, Polynesia.

Pterois lunulata Schlegel.

Pterois lunulata Schlegel: Fauna Japonica, Poiss., pts. 2-4, p. 45, pl. 19, 1843 (type loc., Nagasaki Bay).—Günther: Rept. voyage "Challenger," vol. 1, p. 41, 1880 (Arafura Sea).

Head 3 to 3 1/2; depth 3; D. XIII, 10 to 12; A. III, 7 or 8; scales 70 along lateral line; tubes 30 in lateral line; 8 scales above to bases of median dorsal spines; snout 2 4/5 in head from upper jaw tip; eye 3 1/2 to 4, 2 in snout, 1 in interorbital. Rosy, head with 3 dark transverse bands and body with 12 or 13 alternating with narrower ones. Dorsal spines variegated with dusky. Soft dorsal and anal seldom spotted with darker. Caudal uniform. Pectoral with about 6 irregular rows of dark spots. Ventrals with several rows of dusky spots. Length 270 mm. (Bleeker)

Aden, Zanzibar, Malacca, China, Japan, Queensland.

Pterois radiata Cuvier.

Pterois radiata Cuvier: Hist. nat. Poiss., vol. 4, p. 271, 1829 (type loc., Tahiti).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 81, pl. 56, fig. A, 1874 (Society Islands; Paumotus; Kingsmills; Samoa).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 13, 1877 (Fatuna).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 522, 1900 (Tahiti).—Fowler: op. cit., p. 326, 1901 (Thornton Island.)—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 379, 1905 (1906) (Samoa).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 315, 1911 (Fakarava, Paumotus).—Fowler: B. P. Bishop Mus., Bull. 22, p. 37, 1925 (Tahiti).—Fowler: B. P. Bishop Mus., Bull. 38, p. 21, 1927 (Washington and Howland islands).

Scorpaena radiata (Parkinson) Cuvier: Hist. nat. Poiss., vol. 4, p. 271, 1829 (name in text).

Pterois cincta Günther: Cat. fishes Brit. Mus., vol. 2, p. 125, 1860 (Samoa).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 16, 1869 (Viti Islands, Samoa).—Schmeltz: op. cit., Cat. 5, p. 25, 1874 (Samoa, Viti Islands, Tonga; Tahiti).

Pterois (*Pseudomonopterus*) *vittata* Sauvage: Mus. Hist. Nat. Paris, Nouv. Arch., 2nd ser., vol. 1, p. 135, pl. 1, fig. 10, 1878 (type loc., Nukuhiva, Marquesas Islands).

Pterois antennata (non Bloch) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 83, 1906 (Raiatea; Makatea; Tahiti).

Head 2 1/3 to 2 5/6; depth 2 3/5 to 3; D. XII, 11, 1 or 12, 1; A. III, 6, 1; P. 15; scales 45 to 47 in lateral line to caudal base and 2 or 3 more on latter; tubular scales 24 to 30 in lateral line to caudal base and 1 or 2 more on latter; 6 to 9 scales above lateral line, 14 to 16 below, 4 or 5 predorsal; snout 3 to 3 2/3 in head measured from its own tip; eye 3 to 4; maxillary 2 1/8 to 3; interorbital 4 3/4 to 6.

Body compressed, deepest at front of spinous dorsal. Caudal peduncle well compressed, long as deep and least depth 3 1/6 in total head length. Head width 2 to 2 1/3 in its length. Snout conic, width 1 1/5 in its length. Eye elevated, impinging little on upper profile, hind pupil edge midway in total head length; supraocular tentacle twice eye diameter. Mouth large, lower jaw

slightly protruding. Maxillary reaches eye center, expansion 1 3/4 to 1 4/5 in eye. Teeth in villiform bands in jaws and on vomer, none on palatines. Front nostril about last 2/5 in snout, with filament 1 4/5 in eye; hind nostril longer, close before front eye edge. Interorbital deeply concave. Preopercle edge with 3 obtuse spines. Supraorbital filament long as combined snout and eye. Gill rakers 5 + 10 to 13, clavate, half of gill filaments, which 2 to 2 1/4 in eye. Scales with 6 to 14 basal radiating striae, and 7 to 9 marginal auxiliaries; apical denticles 7 to 50; circuli fine. Along lower side of head 4 mostly whitish filaments. Fifth dorsal spine 1 7/8 in combined head and trunk; third anal spine 2; caudal 1 7/8, apparently rounded behind; pectoral 1 1/5 to caudal base; ventral 2 1/4.

Brown generally. Muzzle pale. Broad brown band from lower hind eye edge back to lower base of pectoral; another from predorsal down and joining 1 from eye to pectoral base; third from front of spinous dorsal down behind pectoral base; fourth to eighth transversely on trunk and tail; all bordered with narrow gray-white line, which on body broader and with narrow median parallel dark line. Dorsals, anals and caudal pale, each spine and ray with alternating whitish and blackish spots. Pectoral and ventral medianly blackish, outer rays grayish-white. Supraocular filament with black and white spots. Length 57 mm.

In the Agassiz Museum 1 from Oahu, obtained by H. Mann. An interesting addition to the Hawaiian fauna. It agrees with Günther's figure and shows a white spot at the pectoral axil. Also 6 from the Society Islands 165 mm. and 14 from Apiang, Kingsmill Islands, 52 to 75 mm., all obtained by Andrew Garrett. Also 2 from Ebon Island, through Rev. B. G. Snow in 1877. One in the Academy from Tahiti, obtained by Andrew Garrett and 2 from Thornton Island. Length 38 to 143 mm. The National Museum has 2 small specimens from Raraka, 39 to 72 mm. (damaged), obtained by the Wilkes Expedition. Other specimens are 1 from Apia and 1 from Fakarava. The Bishop Museum has 1 from Tahiti, 1 from Makatea, 1 from Raiatea and 2 from Honolulu. The first is 120 mm. long, and was found in the Honolulu market in 1908 by J. W. Thompson, who reports only one other since, in 1915 and about the same in size. A small specimen, 28 mm. long is in the collection labeled Honolulu, through W. A. Bryan. It has the same general color-pattern, the supraorbital cirrus about equal to 3 eye diameters and the nasal cirrus equal to 1 eye diameter.

Red Sea, East Africa, Andamans, Micronesia, Polynesia, Hawaii.

Pterois sphex Jordan and Evermann (Pl. XXXV, *A*).

Pterois sphex Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 201, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 464, fig. 203, 1903 (1905) (type).—Fowler: B. P. Bishop Mus., Bull. 22, p. 27, 1925 (Honolulu).

Head 2 3/5; depth 2 4/5; D. XIII, I, 9, 1; A. III, 6, 1; scales 45 in lateral line to caudal base and 4 more on latter; 8 scales above to soft dorsal origin, 14 below, 6 predorsal; tubes in lateral line 24 to caudal base and 1 more on latter; snout 3 7/8 in head from snout tip; eye 3 7/8; maxillary 2 1/4; interorbital 4 1/3.

Body elongately ovoid, compressed, deepest at front of spinous dorsal. Caudal peduncle well compressed, length 7/8 its least depth, which 3 4/5 in total head length. Head width 1 5/6 in its length. Snout conic, about long as wide. Eye large, elevated, impinging on upper profile, hind pupil edge slightly before center in total head length; diameter 1 1/6 in snout, greater than interorbital. Mouth large, mandible protruding. Maxillary reaches opposite front pupil edge, expansion 1 1/2 in eye. Teeth fine, in villiform bands in jaws and on vomer, none on palatines or tongue. Nostrils moderate; anterior about last fourth in snout, fleshy flap 3 3/4 in eye; hind nostril higher, midway between front one and eye. Interorbital deeply concave.

Supraocular edge serrate, with spine in front and 1 behind; spine above front nostril; group of spines at hind eye edge, extended as row to suprascapular keel; each parietal ridge dentate, with last as strong occipital spine; pair of small close-set spines anteriorly and medianly within parietal keels; suborbital stay with double row of denticles; preorbital with lower hind edge with few denticles; few small spines on preopercle keel and 4 or 5 divergent broad spines on preopercle edge. Gill rakers 5 + 12, broad tubercles, 1 1/2 in gill filaments, which 2 7/8 in eye.

Scales with 9 to 11 basal radiating striae, edge scalloped; apical denticles 35 to 38, with 2 or 3 transverse series; circuli fine. Head scaly, except muzzle, interorbital and maxillary. Lateral line concurrent with profile of back, slopes until median at caudal base; tubes small and simple. Fifth dorsal spine 1 1/3 in total head length; fifth ray 1 3/4; third anal spine 2 3/4; second ray 1 1/2; caudal 1 1/3, convex behind; ventral 1 1/8; pectoral 1 3/4 in combined head and body.

Pale brown generally, whitish below. On head 4 transverse vertical seal-brown bands, second crossing eye and widening at preopercle angle and down to prepectoral; first band from lower eye edge. On trunk and tail 6 broad vertical seal-brown bands, interspaces each with 1 paler brown narrow parallel band, sometimes 2, at least on back; all reflected on bases of dorsals and anals. Vertical fins whitish, spotted with brown. Paired fins whitish, finely barred transversely with blackish, only lower marginal part of pectoral whitish.

The Bishop Museum has 5 specimens, 105 to 175 mm. The largest, the example described above, was secured through Mr. Kaneka January 26, 1924. All were obtained at Honolulu. The original figure of the species differs as it does not show dark transverse bands or bars extending basally on the pectoral. My specimens also show more bands on the ventrals, in the larger at least 12 blackish bands and the spots on the soft vertical fins much more numerous.

The type in the National Museum.

Dendrochirus zebra (Quoy and Gaimard).

Pterois zebra Quoy and Gaimard: Voyage "Uranie," Zool., p. 329, 1825 (type loc., Coupang Bay, Timor).—Quoy and Gaimard: Voyage "Astrolabe," Zool., vol. 3, p. 692, pl. 11, fig. 6, 1834 (New Guinea).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 82,, 1874 (Pelew Islands).—Günther: Rept. voyage "Challenger," vol. 1, p. 34, 1880 (Levuka, Fiji).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma).—Seale: B. P. Bishop Mus., Occ. Papers,

vol. 1, no. 3, p. 122, 1900 (Guam).—Garman: Mus. Comp. Zool., Bull., vol. 39, p. 232, 1903 (Suva, Fiji).

Pseudomonopterus (*Dendrochirus*) *zebra* Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

Pterois barberi Steindachner: Akad. Wiss. Wien, Anz., vol. 16, p. 175, June 17, 1900(type loc., between Honolulu and Cape Horn).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 491, pl. 3, fig. 2, 1901 (type).

Head 2 2/5; depth 2 3/4; D. XII, 12, 1; A. III, 6, 1; scales 56 in lateral line to caudal base and 4 more on latter; tubular scales 25 in lateral line to caudal base and 1 more on latter; 8 scales above lateral line to soft dorsal origin, 12 below to spinous anal origin; 18 predorsal scales; snout 3 1/6 in head measured from upper jaw tip; eye 3 3/4; maxillary 2 2/5; interorbital 5 1/10.

Body elongately ovoid, well compressed, deepest about pectoral origin. Caudal peduncle strongly compressed, long as deep; least depth 3 7/8 in total head length. Head compressed, becomes rather constricted above, width 1 4/5 in its length. Snout compressed, width at front of eyes about 1 1/8 in its length. Eye high, strongly projects from upper profile. Maxillary well inclined; expansion 1 3/4 in eye. Gill rakers III + 8, III, low tubercles, barely 1/3 of gill filaments, which 2 1/2 in eye. Scales with 11 basal radiating striae; apical denticles 33 or 34, in about 5 transverse series. First dorsal spine 2 3/4 in total head length; seventh dorsal ray 1 5/6; third anal spine 2 1/3; third anal ray 1 2/5; caudal 1 2/5; ventral 1.

Color in alcohol dull brown. Crossbands dark. Vertical fins all whitish, with fine dusky crossbars. Pectoral and ventral blackish with whitish simple rays to former and edge of latter whitish. Length 103 mm.

One in the Bishop Museum from Agaña on Guam. An adult in the Agassiz Museum from the Gilbert Islands, obtained by Andrew Garrett. One in the National Museum from Fiji, 160 mm. long, from Van Camp. It agrees with Bleeker's colored figure in the spotted rayed vertical fins and the dark crossbands, but has a very rudimentary supraorbital tentacle. I am convinced that *Pterois barberi* is the young, with the long supraorbital flap and long preorbital flap. Moreover the spinous dorsal is with deeply incised membranes anteriorly, the first four at least free for more than half length of spines. The disposition of the dark bands is also of the same general style. This type was but 41 mm. long.

The figure of *Pterois zebra* by Quoy and Gaimard in 1834 is without supraorbital or preorbital tentacles though all the vertical fins are dotted with dusky. Ventrals dull greenish with few scattered dark dots terminally and on spine. Pectoral with 6 dark cross lines. Membranes or dorsal spines extend 2/3 their length basally.

Madagascar, Bourbon, East Indies, China, Micronesia, Polynesia.

Dendrochirus brachypterus (Cuvier).

Pterois brachyptera Cuvier: Hist. nat. Poiss., vol. 4, p. 270, 1829 (no type locality).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 82, 1874 (Samoa).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1407, 1906 (Upolu).

Pterois zebra (non Quoy and Gaimard) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 122, 1900 (Guam; part).

Dendrochirus hudsoni Jordan and Evermann: U. S. Fish Comm., vol. 22, p. 202, 1902 (1903) (type loc., Waikiki; Honolulu).—Snyder: op. cit., vol. 22, p. 536, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, pl. 73, 1903 (1905).

Dendrochirus chloreus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 498, fig. 41, 1902 (1903) (type loc., Honolulu).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 946, 1904 (Honolulu).—Jordan and Snyder: op. cit., vol. 28, p. 126, 1904 (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 465, fig. 204, 1903 (1905) (types; Honolulu).

Brachirus chloreus Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 56, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 27, 1925 (Honolulu).

Dendrochirus barberi (non Steindachner) Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 28, p. 126, 1904 (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 465, 1903 (1905) (Waikiki; Honolulu).

Dendrochirus sausaulele Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 378, pl. 52, fig. 1, 1905 (1906) (type loc., Apia; Pago Pago).

Pterois sausaulele Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 616, 1908 (Suva, Fiji).

In the Bishop Museum 21 specimens from Honolulu and one from Agaña on Guam, identified as *Pterois zebra* by Seale. He says "a young female, taken at the same time, while structurally quite similar is quite differently marked, and much more nearly resembles Quoy and Gaimard's figure (Voyage "Astrolabe," Zool., pl. 11, fig. 6, 1834) except the upper portion of the white lines are not distinctly divided." Largest 166 mm. I also found 2 specimens in the Honolulu markets December 28, 1922. The National Museum has the types of *Dendrochirus hudsoni* and *Dendrochirus chloreus,* also 2 specimens from Honolulu and 1 from Hilo through H. W. Henshaw. Jenkins compared his *Dendrochirus chloreus* with *Peterois barberi* Steindachner, and says it differs among other things in "the absence of the conspicuous tentacle on the head." Now this is not true as some of my Honolulu specimens of *Dendrochirus brachypterus* show the supreorbital tentacle, the preorbital tentacle and also other tentacles on the muzzle. If he had only compared it more carefully with *Dendrochirus brachypterus* it would have been difficult to see how he could have erected a distinct species for the Hawaiian fish. The specimens listed from Honolulu as *Dendrochirus barberi* were said to range from 46 to 102 mm. The dorsal spines become more or less free terminally with age.

There is absolutely no question but that *Dendrochirus sausaulele* is another synonym. I should have thought that even a casual comparison with the nominal *Dendrochirus chloreus*

Jenkins from Hawaii would have been sufficient to have forestalled the proposal of this synonym.

Zanzibar, Red Sea, East Indies, Micronesia, Polynesia, Hawaii.

Centropogon australis (Shaw).

Cottus australis Shaw: Voyage New South Wales, White, p. 266, pl., 1790 (type loc., New South Wales).

Centropogon australis Günther: Cat. fishes Brit. Mus., vol. 2, p. 521, 1860 (Emmanga [Eromanga, New Hebrides]).

D. XV, 9; A. III, 5. Maxillary reaches opposite front eye edge. Scales very small. Third dorsal spine longest, 1 1/2 in head. Second anal spine longer than third. Brownish, with 5 rather irregular dark cross-bands, first from dorsal origin, fourth on caudal base and fifth across caudal. (Günther)

Australia, Melanesia.

Paracentropogon leucoprosopon (Bleeker).

Apistus leucoprosopos Bleeker: Soc. Sci. Ind. Neerl. Act. (Amboina), vol. 1, p. 35, 1856 (type loc., Amboina).

Paracentropogon leucoprosopon Weber: Siboga Exped., vol. 65, p. 498, 1913 (near New Guinea in S. Lat. 1° 42.5′ E. Long. 130° 47.5′ in 32 m.).

Head 2 1/4; depth 2 3/4; D. XIV, 8; A. III, 5; snout 5 in head from snout tip; eye 3 2/3; maxillary 3, reaches opposite eye center. Dorsal and anal rays simple. Golden-brown, dotted with deeper tint. Snout white. Dorsal and anal with golden-brown dots, edges of fins yellowish. Caudal similar, but with transverse rosy band. Length 36 mm. (Bleeker)

East Indies.

Paracentropogon pleurostigma Weber.

Paracentropogon pleurostigma Weber: Siboga Exped., vol. 65, p. 499, fig. 102, 1913 (type loc., near New Guinea, S. Lat. 1° 42.5′, E. Long. 130° 47.5′ in 32 m.).

Head 2 1/2; depth 2 1/4; D. XIII, 8 or 9; A. III, 5 or 6; snout 4 in head; eye 2 4/5; maxillary 2 1/4. Dorsal and anal rays branched. Yellowish-brown, with dark dots and blotches and large, round, dark blotch behind opercle tip largely below lateral line. Fins with dark bands and blotches. Length 48 mm. (Weber)

Amblyapistus taenianotus (Cuvier).

Apistes taenianotus Cuvier: Regne animal, 2nd ed., vol. 2, p. 168, 1828 (on Lacépède).

Tetraroge taenianotus Schmeltz: Mus. Godeffroy, Cat. 4, p. 16, 1869 (Kandavu).

Amblyapistus taenianotus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 83, 1906 (Shortland Island, Solomons).

Taenianotus latovittatus (not description) Lacépède: Hist. nat., Poiss., vol. 4, pp. 303, 304, pl. 3, fig. 2, 1802 (type loc., Mauritius).

Head 3; depth 2 3/4; D. XVII, 7, 1; A. III, 5, 1; P. 1, 11; V. I, 5; 78 scales counted closely and along lateral line to caudal base; tubular scales 30 in lateral line to caudal base and 3 more on latter; 12 scales above lateral line to spinous dorsal base; 26 below to spinous anal origin; snout 4 in head measured from upper jaw tip; eye 2 1/2; maxillary 3; interorbital 5.

Contour elongately ovoid, strongly compressed, deepest about middle of depressed pectoral. Caudal peduncle not free, strongly compressed, least depth 3 1/3 in total head length.

Head swollen below, flattened sides approximating above, front profile steeply oblique, with slight depression before eye; width 1 3/5 in its length. Snout convex over surface, length 3/5 its width. Eye large, hind edge midway in head, long as snout. Mouth little inclined from horizontal, lower jaw slightly projecting. Maxillary reaches eye, expansion 2 in eye, upper edge sheathed by preorbital and with only last fourth free. Preorbital with 2 strong spines, posterior larger. Very small infraorbital spine. Bands of very fine villiform teeth in jaws, on vomer and palatines. Nostrils separated, alike, simple pores; anterior at last 2/5 in snout; posterior higher or level with center of eye. Preopercle edge with 5 spines, uppermost largest and others gradually smaller so that lower 4 only low tubercles; 2 strong spines on preopercle. Interorbital evenly convex.

Gill opening forward midway in eye. Gill rakers 0 + IV, low tubercles, greatly shorter than gill filaments, which 1/2 of eye. Pseudobranchiae long as gill filaments. Isthmus constricted.

Scales with 2 or 3 basal radiating striae; apically little rough, though not denticulate; circuli moderate. Scales firmly adherent, small and only few extending on caudal base; head largely naked, except few above posteriorly. Lateral line complete, of simple slender tubes, concurrent with dorsal profile.

Spinous dorsal begins opposite front eye edge; first spine 1/4 of second, which longest or equals total head length; fifth to last spines nearly subequal. Soft dorsal origin at last third between head and caudal base, last ray joined with caudal basally; fifth dorsal ray 1 1/5 in head. Anal begins midway between pectoral origin and caudal base, spines graduated to third, which longest, first half length of second and second 2/3 of third, which nearly long as longest soft rays; third anal spine 1 2/5 in head; third anal ray 1 1/3. Caudal ends in median point, median rays longest, equals head. Pectoral long, broad, reaches anal, equals head. Ventral base behind that of pectoral, reaches vent or 1 1/5 to anal and spine 1 1/2 in fin; fin 1 1/4 in head.

Color in alcohol dull chocolate-brown. Obscure pale rings, blotches and spots on vertical fins, which also dusky, terminally with narrow whitish edge. Paired fins dusky-brown, especially terminally, with narrow white edges. Length 93 mm.

One in the Bishop Museum from Shortland Island.

As *Apistus taenianotus* Cuvier (Hist. nat. Poiss., vol. 4, p. 298, 1829) gives a detailed account of Lacépède type. There is considerable difference, if only individual, between Bleeker's figure of *Amblyapistus taenianotus* (Atlas ichth., vol. 9, pl. [4] 414, fig. 6, 1877) and Day's figure of the same (Fishes of India, pt. 1, p. 157, pl. 38, fig. 5, 1875).

Jouan describes a *Holocentrum ?* or *Stellifera ?*, from Port de France, New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 290, 1861), evidently this species:

D. XIII, 7; A. III, 4. Head little less than 3 in total length. Snout obtuse. Eyes large, half diameter apart. Mouth oblique. Teeth villiform. Behind orbit spines in 2 or 3 rows. Preopercle spines 2 and spiny keel passes below eye. Opercular spines 3. Spine above pectoral insertion. Soft dorsal higher than spinous fin. Second anal spine long and strong. Pectoral reaches middle of body. Caudal rounded or somewhat pointed. Grayish, with violet. Red on fins. Length 70 mm.

Mauritius, India, East Indies, Melanesia, Polynesia.

Taenianotus triacanthus Lacépède.

Taenianotus triacanthus Lacépède: Hist. nat., Poiss., vol. 4, pp. 303, 306, 1802 (no type loc.; collection given by Holland to France).—Günther: Mus. Godeffroy, Jour.,

vols. 2-3, pts. 5-6, p. 83, pl. 57, figs. A-B, 1874 (Raiatea; Society Islands).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 387, 1923 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 27, 1925 (Honolulu).

Taenianotus garretti Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 83, pl. 57, fig. C, 1874 (type loc., Hawaiian islands).

Taenianotus citrinellus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 636, pl. 81, 1903 (1905) (type loc., off Molokai in 43 to 73 fathoms).

The Bishop Museum has 8 from Malaekahana on Oahu, obtained by C. Montague Cooke, III, on March 10, 1919, length 56 to 102 mm. Most are now in very poor condition. Both yellow and black varieties found together. Also 1 from Kahala on Oahu, March 17, 1919, by the same donor. C. H. Edmondson obtained one at Kahala. The Agassiz Museum has 1 from Ebon Island, Marshall Islands, obtained by Rev. B. G. Snow in April 1877.

East Indies, Polynesia, Hawaii.

Gymnapistus niger (Cuvier).

Apistus niger Cuvier: Hist. nat. Poiss., vol. 4, p. 305, 1829 (type loc., mouth of Ariancoupang River, Pondicherry).

Gymnapistus niger Weber: Nova Guinea, vol. 5, pt. 2, p. 263, 1908 (Klipong River, north New Guinea).

D. III, X, 7; A. III, 5. Jaws equal. Mouth oblique. Palatine teeth present. No scales, skin sparingly with minute prickles. First 3 dorsal spines contiguous with but rather remote from posterior. Pectorals reach vent, ventrals not. Third anal spine longest. Blackish-brown, speckled with black. (Günther)

India, East Indies.

Gymnapistus vestitus (De Vis).

Tetraroge vestitus DeVis: Linn. Soc. New South Wales, Proc., vol. 8, p. 446, 1883 (type loc., South Seas).

D. XVI, 9; A. III, 6. Jaws equal. Mouth-cleft reaches eye center. No barbels. Scales very distinct. Spinous dorsal begins on nape. Olive-brown, dark speckled, markings tending to form 4 bands across back. (DeVis)

SYNANCEJINAE.

Synanceja verrucosa Schneider.

Synanceja verrucosa Schneider: Systema ichth., Bloch, p. 195, 1801 (type loc., India).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 379, 1905 (1906) (Apia).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 616, 1908 (Suva, Fiji).—Nichols: Amer. Mus. Novit., no. 94, Oct. 19, p. 3, 1923 (Mangareva).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 11, 33, 1925 (Guam; Samoa).

Synanceia verrucosa Schneider: Systema ichth., pl. 45, 1801.—Schmeltz: Mus. Godeffroy, Cat. 4, p. 16, 1869 (Viti Islands).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 84, fig., 1874 (spine) (Society Islands).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 25, 1874 (Samoa; Viti; Tonga; Tahiti).—Günther: Rept. voyage "Challenger," vol. 1, p. 34, 1880 (Ovalau, Fiji).—Vaillant: Soc. Philom. Paris, Bull., 7th ser., vol. 11, p. 58, 1886-87 (Tahiti).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1407, 1906 (Upolu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 81, 1906 (Tubuai, Austral Islands).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 316, 1911 (Jaluit, Marshalls).

Synancia verrucosa Günther: Cruise of "Curacoa" (Brenchley), p. 409, 1873 (Solomons).—Peters: Akad. Wiss. Berlin, Monatsb., p. 834, 1876 (1877) (New Hannover).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma).—Garman: Mus. Comp. Zool., Bull., vol. 39, p. 232, 1903 (Thuva, Fiji).

Synanceia brachio Cuvier: Hist. nat. Poiss., vol. 3, p. 328, 1829 (Waigiu; Strong Island; Borabora).

Emmydrichthys vulcanus Jordan and Rutter: Cal. Acad. Sci., Proc., 2nd ser., vol. 6, pp. 221, 562½, pl. 26, 1896 (type loc., Tahiti, Society Islands).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 380, 1905 (1906) (copied).

Synanceia thersites Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 121, 1900 (type loc., Guam).

Deleastes daector Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 81, fig. 22, 1906 (type loc., Tahiti).

Head 2 1/5 to hind opercle end; depth 2 1/3; D. XIII, 6; A. III, 5; snout 3 1/4 in head measured from upper jaw tip; maxillary 2; interorbital 3 1/5. Gill rakers little developed. Color in alcohol mottled deep brown to dusky with fin edges all largely pale, at least tips of rays.

One in the Academy from Apia, 197 mm. The National Museum has 1 without locality, likely from Polynesia, 168 mm., obtained by the Wilkes Expedition. Also 1 from Roi Rod in Tuamotus through Whitaker, 2 from New Guinea, 2 Apia, and 1 Jaluit. Largest 254 mm. In the Bishop Museum the 2 types of *Synanceia thersites,* type of *Deleastes daector* and a specimen from Tubuai. Largest 304 mm. *Deleastes daector* was placed as a distinct genus and species by Seale on account of its smoother body. The alleged much smaller and posterior ventrals are relatively of little importance, as the specimen differs in no important structural way from the other specimens of *Synanceja verrucosa.* Also 1 from Guam in 1923. In the Agassiz Museum I find a specimen labeled "Sandwich Islands" obtained by Andrew Garrett, and the label in Steindachner's handwriting. Other specimens, 5 from the Society Islands also through Andrew Garrett, 3 from Ebon Island, Marshall Islands, and 2 from Kusaie in the Caroline Islands, all through Rev. B. G. Snow.

Likely the doubtful reference to *Scorpaena horrida* by Jouan (Soc. Cherbourg, Mem., vol. 8, p. 255, 1861, Port-de-France, New Caledonia) pertains to *Synanceja verrucosa.* The species *Emmydrichthys vulcanus* is apparently a variant with 2 dorsal spines less than usual.

Red Sea, Mauritius, East Indies, Queensland, Melanesia, Micronesia, Polynesia.

Synancidium horridum (Linné).

Scorpaena horrida Linné: Syst. Nat., 12th ed., p. 453, 1766 (type loc., East Indies).

Synanceia horrida Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 21, 1885 (Rubi, New Guinea).

Differs from *Synaceja* chiefly in the presence of vomerine teeth, a character alleged not to be constant.

India, East Indies, Australia, China.

Leptosynanceia asteroblepa (Richardson) (fig. 51).

Synanceia asteroblepa Richardson: Zool. voyage "Sulphur," Fish, p. 69, pl. 39, figs. 1-3, 1844 (type loc., New Guinea).—Günther: Cat. fishes Brit. Mus., vol. 2, p. 147, 1860 (copied).

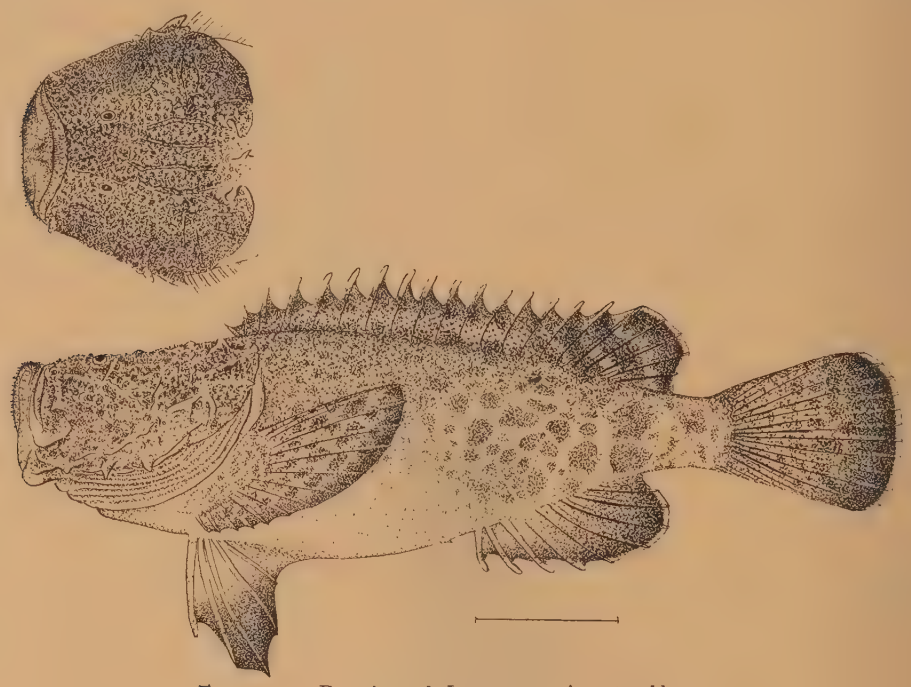

FIGURE 51.—Drawing of *Leptosynanceia asteroblepa.*

Head ridged, without large groove, D. XVI, 5; A. III to V, 5 to 7. Brown, mottled or marbled darker, sometimes as dark blotches. Length 158 mm.

Leptosynanceia greenmani Fowler (Acad. Nat. Sci. Philadelphia, Proc., p. 507, fig. 12, 1905, type loc., Baram, Borneo) is a synonym.

East Indies.

Pelor didactylum (Pallas).

Scorpaena didactyla Pallas: Spiciligia Zool., Fasc. 7, p. 26, pl. 4, figs. 1-3, 1769 (type loc., Indian Ocean).—Jouan: Soc. Cherbourg, Mem., vol. 8, p. 255, 1861 (Port-de-France, New Caledonia).

Pelor didactylum Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 83, 1906 (Faté).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 18, p. 206, 1912 (Port Sandwich, New Hebrides).

Pelor maculatum Cuvier: Hist. nat. Poiss., vol. 4, p. 319, 1829 (type loc., Waigiu).—Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 210, pl. 20, 1830 (Waigiu).—Peters: Akad. Wiss. Berlin, Monatsb., p. 834, 1876 (1877) (New Britain).

Pelor obscurum Cuvier: Hist. nat. Poiss., vol. 4, p. 320, 1829 (type loc., Port Praslin, New Ireland).—Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 211, pl. 21, fig. 2, 1830 (New Ireland).

Head 3; depth 3 3/4; D. XVI, 8, 1; A. II, 11; P. 6, III, 11; V. I, 5; snout 2 in head measured from upper jaw tip; eye 5 1/5; maxillary 2 2/5; interorbital 3 4/5.

Body subcylindrical, elongate, tapers back slender and compressed, greatest depth at pectoral origin. Caudal peduncle slender, very short, least depth 6 in total head length.

Head generally depressed, upper profile deeply indented, except knob on front of snout and elevated eyes, which entirely above upper profile line; width 1 1/8 in its length. Snout wide, with narrow constricted median keel. Mouth greatly inclined, lower jaw protruding. Maxillary reaches 3/4 to eye; expansion equals eye. Teeth small, uniform, biserial in jaws; patch of similar teeth close each side of vomer. Tongue broad, rounded, free along edges, edentulous. Front nostrils each in short tube on front of knob of snout; hind nostril small simple slit on hind face of snout knob. Interorbital deeply concave, largely as pit anteriorly, followed by deep cranial depression but little more elevated. Knobs on head prominent. Preopercle with 2 rather large robust spines.

Gill opening extends forward about first third in head. Gill rakers II + VIII, asperous low tubercles, barely 1/3 of gill filaments, which about half of eye. Pseudobranchiae about 3/4 of gill filaments. Isthmus broadly depressed.

Skin smooth, with many broad fleshy flaps on head; large pair each side of mandible; 1 from each preorbital knob; 1 on suborbital stay; 2 on preopercle ridge; 1 on opercle; each dorsal spine with several small cutaneous flaps and smaller ones on soft dorsal and caudal.

Spinous dorsal begins on head, close after eye, first 3 spines separated from others, all of which with only basal membranes; first dorsal spine 2 1/8 in head, second 1 2/5; sixteenth 2. Soft dorsal and anal joined with caudal peduncle by membrane; first dorsal ray 1 2/3 in head; second anal spine 5 1/8; sixth anal ray 2 2/3; soft anal with tips of all longer rays ending in free fleshy point. Caudal rounded behind, rays all simple, 1 1/5 in head. Pectoral rounded, 2 1/3 in combined head and trunk, lowest 2 rays free and simple, their bases falling before spinous dorsal origin, close after eye. Ventral origin opposite eye center, fin adnate to belly, long as head.

Color in alcohol dark brown generally, mottled and

marbled with blackish and paler. Dorsals largely pale brown, mottled slightly darker and with oblique dusky-brown lines. Soft dorsal with hind half dusky and 4 oblique dark lines on front half. Anal dusky marginally, spotted with dark brown basally like adjacent region of body, free ends of rays pale. Caudal pale, with broad basal and outer transverse dusky band. Pectoral largely dusky-brown, with outer broad pale band and basally pale, also 3 or 4 blackish transverse lines. Ventral dusky terminally. Head mottled and spotted with darker. Iris pale slaty. Length 131 mm.

One specimen in the Bishop Museum from Faté

East Indies, Melanesia.

Pelor caledonicum Sauvage.

Pelor caledonicum Sauvage: Mus. Hist. Nat. Paris, Nouv. Arch., 2nd ser., vol. 1, p. 147, pl. 2, fig. 6, 1878 (type loc., New Caledonia).

Head 2 7/8; depth 5 1/4; D. III, XIV, 7; A. 12; snout 2 in head from snout tip; eye 8 1/5, 4 in snout; maxillary 2 4/5 in head; eye little over 1 1/2 in interorbital and with well-elevated median keel. Dorsal spines higher than body depth, 1 4/5 in head, membranes intact nearly to tips. Length 160 mm. (Sauvage)

Minous pictus Günther.

Minous pictus Günther: Rept. voyage "Challenger," vol. 1, p. 41, pl. 18, fig. D, 1880 (type loc., Arafura Sea, south of New Guinea in S. Lat. 9° 59′, E. Long. 139° 42′).

Head 2 2/5; depth 3 1/5; D. XI, 10 or 11; A. 12; snout 2 1/2 in head; eye 4 4/5, 1 7/8 in snout; maxillary 2 1/10 in head; interorbital 5 7/8. Preorbital spine rather strong, oblique down and back and another small one in front. Dorsal spines slender, 3 anterior little remote from rest of fin. Back and dorsal largely marbled blackish-brown and white. Lower parts and caudal whitish. Paired fins and anal black, hind surface of pectoral with black stripe along each ray. Length 50 to 64 mm. (Günther)

CARACANTHIDAE.

Caracanthus maculatus (Gray).

Micropus maculatus Gray: Zool. miscell., p. 20, 1831 (type loc., Hao Island, Paumotus).—Günther: Cat. fishes Brit. Mus., vol. 2, p. 147, 1860 (type).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 86, 1874 (Hawaiian islands; Tahiti).

Caracanthus maculatus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 515, pl. 20, fig. 5, 1900 (Honolulu), p. 522 (Tahiti).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 491, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 453, fig. 198, 1903 (1905) (Honolulu; Waikiki).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 316, 1911 (Rangiroa, Paumotus).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 54, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 27, 37, 1925 (Honolulu; Tahiti).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 20, 1925 (Pearl and Hermes Reef and Ocean Island).—Fowler: op. cit., Bull. 38, p. 21, 1927 (Palmyra, Washington, Christmas, Howland and Oahu islands).

Caracanthus typicus Kroyer: Nat. Tidsskrift, n. ser., vol. 1, pp. 264, 267, 1844 (type loc., Oahu).

The National Museum has 2 from Fiji and 3 from Tahiti, 28 to 55 mm. long, obtained by the Wilkes Expedition. Others received through the Bureau of Fisheries are 25 Hawaiian, 12 from Waikiki, 6 Honolulu, and 1 Rangiroa in the Tuamotus. The Bishop Museum has 3 from Oahu and 2 from Waikiki through W. A. Bryan and 6 through Thurston and Thaanum in 1922 and 5 through C. Montague Cooke, Jr., in 1913, all from Palmyra Island. Also 16 from Pearl and Hermes Reef and 2 from Ocean Island in 1923. In the Academy 1 from Tahiti, 1 Maui and 1 Honolulu. I have already noticed (1900) that the last had many whitish spots on the upper surface and the Tahiti specimen was with dark brown spots. They still show this contrast at the present time and the Maui specimen differs from all in its unicolor, but with its spinous dorsal distinctly and well separated from the soft fin. The Agassiz Museum has 45 from the Society Islands obtained by Andrew Garrett and 4 from Ebon Island, Marshall Islands, obtained by Rev. B. G. Snow.

Madagascar, Micronesia, Polynesia, Hawaii.

Caracanthus unipinna (Gray).

Micropus unipinna Gray: Zool. miscell., p. 20, 1831 (type. loc., Pacific Sea).—Günther: Cat. fishes Brit. Mus., vol. 2, p. 147, 1860 (type).—Günther: Mus. Godeffroy, Jour., vols. 2-3, pts. 5-6, p. 86, 1874 (Hawaiian islands; Tahiti; Vavau, Fiji; Pelew Islands).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 13, 1877 (Tahiti).

Caracanthus unipinna Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 454, 1903 (1905) (Makemo).[—Regan: Zool. Soc. London, Proc., pt. 1, p. 404, 1909 (Christmas Island, Indian Ocean)].—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 20, 1925 (Wake Island).

Amphiprionichthys unipinna Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 316, 1911 (Makemo, Paumotus).

Amphiprionichthys apistus Bleeker: Act. Soc. Sci. Ind. Neerl., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).—Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, p. 309, pl. 3, fig. 8, 1868 (Kandavu, Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 16, 1869 (Viti Islands).

Amphiprionichthys villosus Schmeltz: Mus. Godeffroy, Cat. 4, p. 16, 1869 (Kandavu) (name only).

Trachycephalus bankiensis DeVis: Linn. Soc. New South Wales, Proc., vol. 8, p. 456, 1883 (type loc., Bank's Group).

Differs from *C. maculatus* in the dorsals entire, without notch separating spinous from rayed fin. Coloration uniform.

The Bishop Museum has 5 from Palmyra, 18 to 39 mm., obtained by C. Montague Cooke, Jr., in 1913. All have the spinous and soft dorsals with very slight notch. Three from Wake Island in 1923. In the National Museum 1 from Apia and 1 from Makemo. The Agassiz Museum has a small one from Makemo.

Clearly synonymous with *Caracanthus* is the nominal *Trachycephalus bankiensis,* the omission of the arrangement of the dorsals and the coloration precluding its certain identification with this species.

Zanzibar, Keeling Islands, Madagascar, East Indies, Micronesia, Polynesia, Hawaii.

HOPLICHTHYIDAE.

Hoplichthys citrinus Gilbert.

Hoplichthys citrinus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 640, fig. 249, 1903 (1905) (type loc., Pailolo Channel, 138 fathoms; near Laysan, 116 to 220 fathoms; off Maui, 143 to 220 fathoms; off Oahu, 154 to 216 fathoms).

Head 3, width 1 1/4 its length; D. VI, 15; A. 17; P. 13 + 3; lateral plates 27; snout 3 1/4 in head from snout tip; eye 4, 1 1/5 in snout; interorbital 4 in eye. Gill rakers 10 or 12 on lower branch of first arch. Lemon or olive-yellow above, below white or silvery. Above and sides more or less freckled with brown. Upper spinous dorsal edge orange and large black basal spot at last spines. Soft dorsal with many round yellowish-green spots. Caudal with some orange, base and terminally dusky. Anal with terminal orange band. Length 175 mm. (Gilbert)

Hawaii.

Hoplichthys platophrys Gilbert.

Hoplichthys platophrys Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 642, fig. 250, 1903 (1905) (type loc., Laysan Island in 351 fathoms).

Differs from the preceding in the smaller eye 5 1/4 in head from snout tip, equal to interorbital or 1 2/3 in snout. Only known from the type, 70 mm. long.

Hawaii.

PLATYCEPHALIDAE.

Platycephalus indicus (Linné).

Callionymus indicus Linné: Systema nat., 10th ed., p. 250, 1758 (type loc., Asia).

Platycephalus indicus Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).—Bleeker: Kon. Akad. Wet. Amsterdam, Verh., vol. 19, p. 8, 1879 (Utanata, New Guinea).

Platycephalus endrachtensis Quoy and Gaimard: Voyage "Uranie," Zool., p. 353, 1825 (type loc., Shark Bay and Endracht Land).

Distinguished by its small scales, 130 in a lateral series. Lateral line smooth. Body reticulated with bluish or yellowish. Caudal whitish, with 3 longitudinal black bands. Reaches 459 mm.

Red Sea, Aden, Zanzibar, Mozambique, Natal, Madagascar, Ceylon, India, East Indies, China, Japan, Philippines, Queensland.

Platycephalus fuscus Cuvier.

Platycephalus fuscus Cuvier: Hist. nat. Poiss., vol. 4, p. 177, 1829 (type loc., Port Jackson).

Cottus otaitensis (Parkinson) Cuvier: Hist. nat. Poiss., vol. 4, p. 177, 1829 (type loc., Tahiti).

Differs from *P. indicus* in that the head and fins are spotted with brown. Reaches 1016 mm.

Australia, Polynesia.

Thysanophrys crocodilus (Tilesius).

Platycephalus crocodilus Tilesius: Reise Krusenstern, pl. 59, fig. 2, 1812 (type loc., Nagasaki).

Platycephalus tentaculatus [Rüppell, Neue Wirbelth. Fisch., p. 104, pl. 26, fig. 2, 1835, type loc., Tor, Red Sea] Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 166, pl. 107, figs. A-B, 1876 (Pelew Islands).—Schmeltz: Mus., Godeffroy, Cat. 6, p. 13, 1877 (Pelew Islands).

Platycephalus punctatus Cuvier: Hist. nat. Poiss., vol. 4, p. 178, 1829 (type loc., Trinquémale, Ceylon; Vanicoro).—Quoy and Gaimard: Voyage "Astrolabe," Zool., vol. 3, p. 682, 1834 (non pl. 10, fig. 2) (Vanicoro).

Platycephalus malabaricus [Cuvier, Hist. nat. Poiss., vol. 4, p. 180, 1829 (type loc., Mahé)] Günther: Rept. voyage "Challenger," vol. 1, p. 41, 1880 (Arafura Sea in S. Lat. 9° 59′ E. Long 139° 42′ in 28 fathoms).

Head 2 4/5, width 2; D. I, VIII—1, 11 or 1, 12; A. 1, 10 or 1, 11; scales 106 to 115[3] in lateral line, 8 or 9 above; snout 3 1/5 in head from snout tip; eye 4 to 5, 1 1/2 in snout; maxillary 2 3/5 in head; interorbital 2 in eye. First few scales of lateral line armed with small spine. Head spiny. Olivaceous above, whitish below. Back with irregular dark clouding, 4 more conspicuous as blotches. Head above and back sparsely punctate with dusky or blackish. Spinous dorsal dusky above and behind. Dorsal and pectoral rays dotted with dusky. Caudal pale, with large irregular dusky blotches. Anal whitish. Pectoral with rows of dark spots. Ventral whitish, dusky terminally. Length 315 mm. (Bleeker)

The oldest name of this species seems to be *Platycephalus fuscus* given with reference to Krusenstern by Jordan and Richardson and which I have not verified.

Red Sea, Natal, Ceylon, India, East Indies, Philippines, China, Japan, Queensland, Melanesia, Micronesia.

Thysanophrys quoyi (Bleeker).

Platycephalus quoyi Bleeker: Nat. Tijds. Ned. Ind., vol. 12, p. 206, 1856-57 (type loc., Ternate; Amboina).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 360, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 267, 1883 (New Guinea).

Platycephalus punctatus (non Cuvier) Quoy and Gaimard: Voyage "Astrolabe," Zool., vol. 3, pl. 10, fig. 2, 1834 (non description).

Differs from *Thysanophrys crocodilus* in the unarmed or smooth scales of the lateral line. Caudal with small brown spots. Reaches 225 mm.

East Indies.

Thysanophrys nematophthalmus (Günther).

Platycephalus nematophthalmus Günther: Cat. fishes Brit. Mus., vol. 2, p. 184, 1860 (type loc., Port Essington and Victoria).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 166, pl. 107, fig. C, 1876 (head of type).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 360, 1882 (New Guinea).

Head 3, width 1 4/5 its length; D. I, VIII—11; A. 11; scales 105 in smooth lateral line; snout 3 1/3 in head from snout tip; eye 4 7/8, 1 3/5 in snout; maxillary 2 3/5 in head; interorbital 2 in eye. Moderate tentacle above orbit and single flat one below preopercle angle, none at nostril. Preopercle spines rather short, nearly equal. Brown, with 7 dark crossbands on back. Fins spotted with brown. Dorsals and caudal with spines and rays crossed by fine black lines. Length 225 mm. (Günther)

Australia, East Indies.

Thysanophrys japonicus (Tilesius).

Platycephalus japonicus Tilesius: Reise Krusenstern, pl. 59, fig. 1, 1812 (type loc., Nagasaki).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 16, 1869 (Samoa).

Differs from *Thysanophrys crocodilus* in presence of conspicuous fleshy flap under preopercle spine, flap also terminally notched below preopercular spine. Like *Thysanophrys quoyi* first 3 or 4 scales of lateral line may each bear a small spine. Scales 70 to 80.

Thysanophrys variolosus (Günther).

Platycephalus variolosus Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 167, pl. 109, fig. A, 1876 (type loc., Samoa islands).

[3] Bleeker gives the scales 160 to 115. I take 160 an error for 106. His figure shows 107.

Head 3 1/4, width 1 1/4 its length; D. I, VII, 11; A. 12; scales 75 in smooth lateral line; snout 3 1/3 in head from snout tip; eye 5 1/2, 1 3/4 in snout; maxillary 2 1/4 in head; interorbital 1 3/5 in eye. Vomerine teeth in 2 bands. Back with 5 dark bands dotted darker brown. Some white dots along lateral line. Head marbled light brown. Dark brown band across interorbital and down over cheek. Fin-rays with brown and white spots. Length 165 mm. (Günther)

Thysanophrys sculptus (Günther).

Platycephalus sculptus Günther: Rept. voyage "Challenger," vol. 1, p. 41, pl. 17, fig. A, 1880 (type loc., Arafura Sea).

Head 3, greatest width 1 1/3 its length; D. IX, 11; A. 12; scales 70 in smooth lateral line; snout 3 in head from snout tip; eye 4 1/4; maxillary 2 1/2; interorbital 3 in eye. Head deeply sculptured, ridges spinous. Linear band of vomerine and palatine teeth. Nearly uniform, with few indistinct crossbands. Spinous dorsal edged black. Length 216 mm. (Günther)

Thysanophrys isacanthus (Cuvier).

Platycephalus isacanthus Cuvier: Hist. nat. Poiss., vol. 4, p. 180, 1829 (type loc., Indies; Waigiu; Buru).—Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 214, 1830 (Waigiu).—Sauvage: Mus. Hist. Nat. Paris, Nouv. Arch., vol. 8, p. 55, pl. 7, fig. 1, 1873 (type).—Günther: Rept. voyage "Challenger," vol. 1, p. 41, 1880 (South of New Guinea in S. Lat. 10° 36′ E. Long. 141° 55′).

Head 3 1/2 in total; D. IX— I, 11; A. 12; scales 60 to 65 in unarmed lateral line; eye 1 1/2 in snout; interorbital equals vertical eye diameter. Preopercular spines equal or subequal. Above somewhat reddish-brown, with traces of bands. Below pale grayish. Lateral keels of head gray with brown spots. Fin-rays spotted brown. First dorsal spotted like other fins. Length 153 mm. (Bleeker)

East Indies.

Thysanophrys bataviensis (Bleeker).

Platycephalus bataviensis Bleeker: Nat. Tijds. Ned. Ind., vol. 4, p. 460, 1853 (type loc., Batavia).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 167, 1876 (Ponapé).—Weber: Siboga Expd., vol. 65, p. 508, 1913 (between Loslos Island and "Gebroken Island" near west New Guinea in 18 m.).

Platycephalus punctatus (non Cuvier) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 123, 1900 (Guam).

Head 2 3/4; depth 9; D. VIII—11; A. 12; scales 60 in lateral line to caudal base and 6 more on latter; tubes 50 in lateral line to caudal base; 6 scales above lateral line, 18 below; 10 predorsal scales; snout 3 in head, measured from upper jaw tip; eye 6 1/4; maxillary 2 3/4; interorbital 6. Least depth of caudal peduncle 7 1/4 in total head length. Head width 1 7/8 in its length. Mandible 1 9/10 in head. Second dorsal spine 2 1/8 in head; second dorsal ray 2 1/3; second anal ray 4 1/8; caudal 1 5/6; pectoral 2 1/4; ventral 1 1/4.

Two in the Bishop Museum from Agaña on Guam, 126 to 160 mm. This species is likely the same as *Thysanophrys isacanthus*.

East Indies, Micronesia.

Thysanophrys malayanus (Bleeker).

Platycephalus malayanus Bleeker: Nat. Tijds. Ned. Ind., vol. 5, p. 490, 1853 (type loc., Padang, Sumatra).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

Head 3, width 1 1/3 its length; D. I, VIII—1, 10 or 1 11; A. 1, 10 to 1, 12; scales 60 in unarmed lateral line, 7 above; snout 2 7/8 in head measured from snout tip; eye 5 3/4, 1 3/4 in snout; maxillary 2 3/4 in head; interorbital 1 1/6 in eye. Greenish above, whitish below. Head and back with irregular pink or silvery ocelli, formed as streaks on sides of head. Fin-rays, except anal, variegated with brown. Length 198 mm. (Bleeker)

East Indies.

Thysanophrys spinosus (Schlegel).

Platycephalus spinosus Schlegel: Fauna Japonica, Poiss., pts. 2-4, p. 40, pl. 16, figs. 1-2, 1843 (type loc., Japan).—Günther: Rept. voyage "Challenger," vol. 1, p. 42, 1880 (South of New Guinea in S. Lat. 10° 36′ E. Long. 141° 55′).

Known by its large scales, 40 in lateral line, which with anterior third or half, armed with short spines. Ridges of head serrated. Small flap on uppper rim of cornea. Back with 4 dark blotches, dorsals, pectoral and caudal spotted. Reaches 114 mm.

Japan, East Indies.

Thysanophrys macrocephalus (Weber).

Platycephalus macrocephalus Weber: Siboga Exped., vol. 65, p. 508, fig. 107, 1913 (type loc., Bali Sea in 100 m.; Sapeh Straits in 69 m.; north of Waigiu in N. Lat. 0° 3′ .8 E. Long. 130° 24′ .3 in 141 m.; south coast of Timor in 36 m.).

Head 2 3/5, width 1 2/5 its length; D. I, VII—11; A. 11; scales 33 in unarmed lateral line, 2 above; snout 3 7/8 in head from snout tip; eye 3 4/5, equals snout; interorbital 3 in eye. Suborbital ridges finely serrate. Brown, with 3 dark blotches above, first at spinous dorsal, second at soft dorsal and third at caudal base. Spinous dorsal with black apical point. Soft dorsal, caudal and pectoral dotted with black. Ventral with 2 dark crossbands. Lower surfaces white. Length 50 to 90 mm. (Weber)

Resembles *Thysanophrys spinosus* but without orbital cirrhus or serrate cranial ridges and with larger scales.

East Indies.

Thysanophrys grandisquamis (Weber).

Platycephalus grandisquamis Weber: Siboga Exped., vol. 65, p. 509, fig. 108, 1913 (type loc., near New Guinea, S. Lat. 1° 42′.5 E. Long. 130° 47′.5 in 32 m.).

Head 3, width 1 1/4 its length; D. I, VII, 11; A. 11; scales 28 or 29 in unarmed lateral line, 2 above; snout 3 1/4 in head from snout tip; eye 4, 1 1/8 in snout; interorbital slightly greater than eye or equals snout. Suborbital ridge finely serrate. Reddish-brown above, with darker marbling. Dorsal with dark apical blotch. Upper fins with dark marblings and blotches. Length 28 or 29 mm. (Weber)

East Indies.

Thysanophrys serratus (Cuvier).

Platycephalus serratus Cuvier: Hist. nat. Poiss., vol. 4, p. 190, 1829 (type loc., Trinquémale, Ceylon).—Peters: Akad. Wiss. Berlin, Monatsb., p. 839, 1876 (1877) (Cartaret Harbor, New Ireland).

Head 4 in total; D. I, VIII, 11 or 12; A. 11. Crests on head and suborbital serrated, without spines. Lateral line smooth. Reddish-brown, with 6 to 8 irregular brown bands from back to white abdomen. Fins gray, with black points. Top of dorsal with black blotch. Ventrals bluish above, whitish below. Length 178 mm. (Day)

Ceylon, Melanesia.

Rogadius pristiger (Cuvier).

Platycephalus pristiger Cuvier: Hist. nat. Poiss., vol. 4, p. 191, 1829 (type loc., New Guinea; Celebes).—Quoy and Gaimard: Voyage "Astrolabe," Zool., vol. 3, p. 685,

pl. 10, fig. 5, 1834 (Port Dorey, New Guinea).—Günther: Rept. voyage "Challenger," vol. 1, p. 42, 1880 (south of New Guinea in S. Lat. 10° 36′ E. Long. 141° 55′).

Head 2 3/4, width 1 3/4 in its length; D. I, VIII—1, 10 or 1, 11; A. 1, 10 or 1, 11; scales 55 in smooth lateral line, 5 above; snout 2 7/8 in head from snout tip; eye 4 3/4, 1 3/4 in snout; maxillary 2 2/5 in head; interorbital 2 in eye. Cranial and suborbital ridges finely or minutely serrate. Reddish-olive above, silvery-white below. Irregular transverse brown bands above, diffuse with age. Fin-rays except anal, with small brown spots. Length 161 mm. (Bleeker)

East Indies.

Bembradium roseum Gilbert.

Bembradium roseum Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 637, 1903 (1905) (type loc., Pailolo Channel in 138 fathoms).

Bembradium roseus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, pl. 62, 1903 (1905).

Head 2 1/2; depth 5 7/8; D. IX—12; A. 11; scales 28 in lateral line, 4 above, 8 below; snout 2 3/4 in head; eye 4 4/5, 1 3/4 in snout; maxillary 2 1/5 in head; interorbital 5 1/2 in eye. Gill rakers 6 on lower branch of first arch. Reddish over olive above, belly whitish. Soft dorsal and caudal barred red, anal and spinous dorsal uniform. Pectoral with irregular red blotches. Ventral silvery, tinged red. Length 90 mm. (Gilbert)

Hawaii.

PERISTEDIIDAE.

Peristedion engyceros (Günther) (Pl. XXXVI, *A*).

Peristethus engyceros Günther: Zool. Soc. London, Proc., p. 663, fig. (head above), 1871 (type loc., Hawaiian islands).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 168, fig. (head above), 1877 (type).

Peristedion engyceros Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 639, 1903 (1905) (off Oahu; Laysan; Kauai; Maui; in 55 to 362 fathoms).—Jordan: U. S. Nat. Mus., Proc., vol. 59, p. 654, fig. 7, 1921 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 56, Dec. 1922 (cast in Bishop Museum).

Peristedion gilberti Jordan, U. S. Nat. Mus., Proc., p. 655, fig. 8b, 1821 (type loc., Hawaii).

Head from snout tip 2 3/4; depth 5 3/4; D. VII, 21; A. 21; P. 13; snout 2 in head; eye 5; maxillary 1 2/3; interorbital 6. Least depth of caudal peduncle 10 1/5 in head. Head width 1 2/5 in its length measured from snout tip. First dorsal spine 3 2/3 in head; eighth dorsal ray 3 1/10; eighth anal ray 4; caudal 2 3/5; pectoral 1 2/3; ventral 2 1/10. Color in alcohol uniform pale brown.

Differs from *Peristedion hians* in the longer narrow preorbital prongs, these slender, with nearly parallel edges and not triangular.

The Bishop Museum has 1 obtained in the Honolulu market in 1908, length 279 mm. Another from Kau in Hawaii, November 1919, collected by Carl Shurz Carlsmith. In the National Museum a series of Hawaiian specimens, including the 2 from the Mauna Loa lava flow, October 6, 1919, through Tom Reinhardt.

Peristedion hians Gilbert and Cramer.

Peristedion hians Gilbert and Cramer: U. S. Nat. Mus., Proc., vol. 19, p. 419, pl. 41, figs. 1-2, 1897 (type loc., Hawaiian islands at Stations 3470, 3472, 3476, in 295 to 343 fathoms).—Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 638, 1903 (1905) (off Molokai; Pailolo Channel; south of Oahu; Kauai; Maui; in 165 to 459 fathoms).

Head 2 1/3, from snout tip, width 1 3/5 its length; depth 5 2/3; D. VII, 21 or 22; A. 21 or 22; snout 2 1/3 in head; eye 4 1/3, 1 7/8 in interorbital; interorbital 5 3/5. Gill rakers 4+22. Preorbital prongs broadly triangular. Dull reddish, young with much dusky especially along plate edges on head and body. Length 190 mm. (Gilbert)

In the National Museum the type and a series of Hawaiian specimens.

Peristedion liorhynchus Günther.

Peristethus liorhynchus Günther: Zool. Soc. London, Proc., p. 663, pl. 62, 1871 (type loc., Manado, Celebes).—Günther: Rept. voyage "Challenger," vol. 1, p. 56, 1880 (Nares Harbor, Admiralty Island in 152 fathoms).

D. VII, I, 18; A. 21; scutes 34 in lateral line. Preorbital prongs moderately wide, length 1/3 distance between their extremity and front edge of orbit. Snout and forehead without spines and preopercular ridge not ending in spine. Interorbital concave, width equals eye. Anterior abdominal scutes longer than broad, much larger than posterior, which broader than long. Red. coarsely reticulated with black. Dorsals, anals and pectorals with black edges. Length 212 mm. (Günther)

East Indies, Melanesia.

TRIGLIDAE.

Chelidonichthys kumu (Cuvier).

Trigla kumu (Lesson) Cuvier: Hist. nat. Poiss., vol. 4, p. 36, 1829 (type loc., New Zealand).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 16, 1869 (South Sea).

Known by its very small scales, 100 or more in lateral line which unarmed or without bony shields. Dorsal bases with row of spiny shields each side. Length 160 mm.

Australia, New Zealand, China, Japan.

CEPHALACANTHIDAE.

Dactyloptena orientalis (Cuvier) (Pl. XXXV, *B*).

Dactylopterus orientalis Cuvier: Hist. nat. Poiss., vol. 4, p. 98, pl. 76, 1829 (type loc., Mauritius; Waigiu).—Thiollière: Fauna Woodlark, p. 154, 1857 (Woodlark Island).—Jouan: Soc Cherbourg, Mem., vol. 8, p. 296, 1861 (Port-de-France, New Caledonia).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, pp. 2, 3, 1859 (Doreh, New Guinea).—Kner: Reise "Novara," Fische, vol. 1, 1865, p. 125 (Tahiti).—Günther: Cruise of "Curaçoa" (Brenchley), p. 410, 1873 (Solomons).—Schmeltz: Mus. Godeffroy, Cat., 5, p. 26, 1874 (Tonga).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 169, 1877 (Hawaii; Society Islands; Paumotus).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 13, 1877 (Huahine).—Günther: Rept. voyage "Challenger," vol. 1, p. 42, 1880 (Arafura Sea in S. Lat. 9° 59′ E. Long. 139° 42′).—Vaillant: Soc. Philom. Paris, Bull., 7th ser., vol. 11, p. 57, 1886-87 (Tahiti; Paumotu).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 498, 1901 (Honolulu).

Cephalacanthus orientalis Fowler: Acad. Nat. Sci., Philadelphia, Proc., p. 516, 1900 (Hawaiian islands).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 499, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 536, 1902 (1904) (Honolulu; Puako; Hunalei Bay; Lahaina).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 946, 1904 (Honolulu).—Jordan and Snyder: op. cit., vol. 28, p. 126, 1904 (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 473, fig. 208, 1903 (1905) (Hilo; Honolulu; Molokai).—Seale: B. P.

Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 83, 1906 (Tahiti).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).

Dactyloptena orientalis Jordan and Richardson: U. S. Nat. Mus., Proc., vol. 33, p. 665, 1909 (Hilo).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 57, Dec. 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 27, 1925 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 38, p. 21, 1927 (Honolulu).

Trigla volitans (non Linné) Lichtenstein: Descriptiones animalium, p. 155, 1844, (tropical Pacific Ocean).

Gasterosteus volitans Lichtenstein: Descriptiones animalium, p. 155, 1844 (tropical Pacific Ocean).

Head 3 1/4 to 3 7/8; depth 4 to 5 1/3; D. I—I—V—I—8; A. 6; scales 43 to 48 in lateral series of lateral line; 7 scales above lateral line, 13 below; snout 2 3/4 in head; eye 2 3/4 to 3 2/5; maxillary 2 to 2 2/5; interorbital 1 3/5 to 2. Gill rakers obsolete, rudimentary. Color in alcohol faded dull brown, back spotted.

In the Academy 1 through J. K. Townsend and 2 through W. H. Jones, from Hawaiian islands, 60 to 158 mm. The Bishop Museum has 18 from Honolulu and 1 from Tahiti. Largest 398 mm. I obtained 1 at Waikiki, October 29, 1922, and 3 in the Honolulu market December 29. The National Museum has 15 from Honolulu and 1 Hilo. The Agassiz Museum has 2 Hawaiian and 1 from the Society Islands, all obtained by Andrew Garrett. Also 5 from Vavau, Tonga.

Cape of Good Hope, Mauritius, East Indies, China, Japan, Melanesia, Polynesia, Hawaii.

POMACENTRIDAE [4]

Premnas biaculeatus (Bloch).

Chaetodon biaculeatus Bloch: Nat. ausländischen Fische, pt. 4, p. 11, pl. 219, fig. 2, 1790 (type loc., East Indies).

Premnas biaculeatus Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 362, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 272, 1883 (Hood Bay, New Guinea).

Premnas trifasciatus Thiollière: Fauna Woodlark, p. 199, 1857 (Woodlark Island).

Preorbital with strong spine extended backward.

Mauritius, East Indies, Melanesia.

Amphiprion ephippium (Bloch).

Lutjanus ephippium Bloch: Nat. ausländischen, Fische, pt. 4, p. 121, pl. 250, fig. 2, 1790 (type loc., East Indies).

Amphiprion ephippium Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 81, 1900 (1901) (Agaña, Guam).—Fowler: B. P. Bishop Mus., Bull. 22, p. 14, 1925 (Guam).

Amphiprion arion De Vis: Linn. Soc. New South Wales, Proc., vol. 8, p. 450, 1883 (type loc., South Seas).

Amphiprion tricolor Günther: Cat. fishes Brit. Mus., vol. 4, p. 8, 1862 (type loc., Port Essington and South Australia).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 21, 1869 (Viti Islands; Samoa).—Schmeltz: op. cit., Cat. 5, p. 32, 1874 (Tahiti).

Amphiprion ephippium var. *tricolor* Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 225, 1881 (Vavau).

[4] The reference of *Eutroplus maculatus* Kner, Reise "Novara," Fische, vol. 2, p. 263, 1865 (Tahiti) is probably erroneous as no member of the Chromidae occurs in Oceania.

White band from before dorsal down over postocular. Fins and abdomen yellowish, trunk and tail dark brown.

In the Bishop Museum 4 from Agaña on Guam, 84 to 110 mm. Also 1 from Guam in 1923. One in the National Museum obtained by the Wilkes Expedition at Fiji.

Jouan notices as *Amphiprion* (Soc. Cherbourg, Mem., vol. 9, p. 117, 1863) a specimen 30 mm. long from Port de France, New Caledonia.

Madagascar, Reunion, India, Nicobars, Andamans, East Indies, Queensland, Micronesia, Polynesia.

Amphiprion polymnus (Linné).

Perca polymna Linné: Systema nat., 10th ed., p. 291, 1758 (type loc., Indies).

Amphiprion polymnus Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1395, 1906 (Samoa).

Anthias clarkii Bennett: Fishes of Ceylon, pl. 29, 1828 (type loc., Ceylon).

Amphiprion clarkii Schmeltz: Mus. Godeffroy, Cat. 4, p. 21, 1869 (Kandavu).

Amphiprion ephippium var. *clarkii* Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 224, 1881 (Pelew Islands).

Amphiprion chrysopterus Cuvier: Hist. nat. Poiss., vol. 5, p. 301, 1830 (no type locality).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 611, fig 4, 1908 (Suva, Fiji).

Amphiprion chrysapterus Schmeltz: Mus. Godeffroy, Cat. 4, p. 21, 1869 (Kandavu).

Amphiprion ephippium var. *chrysopterus* Günther: Mus. Godeffroy, Jour., vol. 4, p. 225, pl. 122, fig. C, 1869 (Kingsmills).

Amphiprion xanthurus Cuvier: Hist. nat. Poiss., vol. 5, p. 302, 1830 (type loc., Mauritius).

Amphiprion ephippium var. *xanthurus* Günther: Mus. Godeffroy, Jour., vol. 4, p. 224, 1869 (Apia; Ponapé).

Sparus milii Bory St. Vincent: Dict. classique d' hist. nat., vol. 16, p. 130, pl. (113), fig. 2, 1831 (type loc., "La baie Chiens-Marins" [Shark Bay, West Australia]).

Amphiprion milii Thiollière: Fauna Woodlark, p. 198, 1857 (Woodlark Island).

Amphiprion chrysargyrus Richardson: Rept. British Assn. Adv. Sci. (Ichth. China Japon.), p. 254, 1846 (type loc., China).

Amphiprion chrysargurus Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).

Amphiprion clarkii var. *chrysarguros* Schmeltz: Mus. Godeffroy, Cat. 4, p. 21, 1869 (Kandavu).

Head 3 1/5 to 3 1/3; depth 2 to 2 1/10; D. XI, 15, 1; A. II, 13, 1; tubes 35 to 41 in upper section of lateral line, pores 6 in lower section to caudal base and 3 more on latter; 7 or 8 scales above lateral line, 16 to 18 below, 12 to 17 predorsal; snout 3 1/3 to 3 1/2 in head measured from upper jaw tip; eye 2 7/8 to 3 1/8; maxillary 2 7/8 to 3; interorbital 3.

Body oblong-ovoid, compressed, deepest at spinous dorsal origin. Caudal peduncle strongly compressed, length 2/3 to 1 in its least depth, which 1 3/4 to 2 in total head length.

Head width 1 2/3 to 1 3/4 in its length. Snout short, obtusely convex, length 2/3 its width. Eye elevated, hind pupil edge midway in head length; diameter greater than snout, equals interorbital. Mouth moderate, small, lower jaw protruding. Maxillary reaches slightly beyond front eye edge, not quite to pupil; expansion 2 1/4 in eye. Teeth strong, conic, uniserial in jaws, anterior 6 in each jaw largest. Nostril small, at last third in

snout. Interorbital convex. Suborbital with small downward directed spine. Hind preopercle edge unevenly and weakly denticulated. Opercle, subopercle and interopercle with spinescent edges. Gill rakers 3 + 11, lanceolate, 1 1/6 in gill filaments, which 1 2/3 in eye.

Scales with 7 or 8 basal radiating striae; apical denticles 43 to 58, basal elements in 2 or 3 series transversely; circuli fine. Third dorsal spine 1 7/8 to 2 1/5 in head; eleventh dorsal ray 2; second anal spine 2 2/3 to 2 4/5; eleventh anal ray 2 to 2 1/10; caudal 1, rounded convexly behind; pectoral 1 to 1 1/10; ventral 3 to 3 1/2 in combined head and trunk.

Body nearly Mars brown. White band transversely from predorsal down to opercle and subopercle. Second white band from last dorsal spines and front of soft dorsal down to vent, narrowing little below. Sometimes third band across caudal peduncle at caudal base, also sometimes upper caudal edge whitish. Length 42 and 85 mm.

In the Agassiz Museum 9 from Apiang, Kingsmill Islands, obtained by Andrew Garrett.

Red Sea, East Africa, East Indies, China, Japan, Queensland, Melanesia, Micronesia, Polynesia.

Amphiprion bicinctus Rüppell.

Amphiprion bicinctus Rüppell: Atlas Reise Nord. Afrika, Fische, p. 139, pl. 35, fig. 1, 1828 (type loc., Tor; Massaua; Red Sea).—Kittlitz: Denkw. Reise Mikronesien, vol. 2, p. 418, 1858 (Muriljo; Fauance).—Günther: Cruise of "Curacoa" (Brenchley), p. 410, 1873 (Solomons).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 16, 1877 (South Pacific Ocean).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 229, 1898 (Rota, Mariannes).

Amphiprion ephippium var. *bicinctus* Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 224, 1881 (Solomons).

Amphyprion bicinctus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 82, 1900 (1901) (Guam).

Amphiprion papuensis Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 271, 1881 (type loc., D'Entrecastreaux Group).

Head 3 1/2; depth 2; D. X, 16, 1; A. II, 13, 1; tubes 34 in upper arch of lateral line followed by 7 pores and 14 pores in straight section to caudal base; 10 scales above lateral line, 20 below; 18 predorsal scales; snout 3 2/5 in head; eye 3; maxillary 2 4/5; interorbital 2 3/4.

Body ovoid, strongly compressed. Least depth of caudal peduncle 1 5/6 in head. Head width 1 2/3 in its length. Snout obtuse, rather depressed, length half its width. Eye larger than snout. Maxillary vertically inclined, reaches opposite eye. Teeth uniserial, strong, conic, front 6 in each jaw enlarged. Preorbital and suborbital edge strongly denticulate; hind preopercle edge finely denticulate; opercle, subopercle and interopercle with slender denticulations. Gill rakers 6 + 13, lanceolate, 1 1/5 in gill filaments or 3 in eye. Scales with 5 to 7 basal radiating striae, edge scalloped; apical denticles 46 to 50, basal elements in 4 to 6 series; circuli fine. First dorsal spine 3 in head; last spine 3; eighth dorsal ray 1 2/3; second anal spine 2 1/2; eighth anal ray 2; caudal little longer than head; pectoral 1; ventral 1.

Brown generally, fins, front of head and breast pale. Broad white band, with dark brown margin, from predorsal over postocular down to side of breast, slightly narrowing behind. Narrower white band from last dorsal spines to spinous anal. Iris pale slaty. Length 78 mm.

One in the Bishop Museum from Guam, obtained July 14, 1900.

Amphiprion papuensis is evidently this species. It is described with 14 dorsal rays, 12 anal rays and lateral line 50.

Red Sea, Zanzibar, Queensland, Melanesia, Micronesia.

Amphiprion polylepis (Bleeker).

Prochilus polylepis Bleeker: Kon. Akad. Wet. Amsterdam, 2nd ser., vol. 11, p. 135, 1877 (type loc., Amboina; southeast New Guinea).—Bleeker: Hollandsche Mattsch, Harlem, Verh., no. 6, 3rd ser., vol. 2, p. 22, 1877 (New Guinea).

? Amphiprion frenatus Brevoort: Exped. Perry Japan, vol. 2, p. 263, pl. 6, fig. 4, 1856 (type loc., Lew Chew).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 229, 1898 (Saypan, Mariannes).

Red Sea, Zanzibar, Mozambique, Mauritius, Ceylon, India, East Indies, Riu Kiu, China, Japan, Melanesia, Micronesia.

Amphiprion melanopus Bleeker.

Amphiprion melanopus Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 561, 1852 (type loc., Amboina).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 21, 1869 (South Seas).—Günther: Cruise of "Curacoa" (Brenchley), p. 410, 1873 (Solomons).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 271, 1883 (D'Entrecastreaux Group, New Guinea).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 33, 1885 (Rubi, New Guinea).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 278, 1905 (1906) (Apia; Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 22, p. 14, 1925 (Guam).

Prochilus melanopus Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 281, 1868 (Doreh, New Guinea).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

Amphiprion ephippium var. *melanopus* Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 225, pl. 122, fig. D, 1881 (Tonga; Samoa; Ponapé; Solomons).

Amphiprion monofasciatus Thiollière: Fauna Woodlark, p. 198, 1857 (type loc., Woodlark Island).

Amphiprion ephippium (non Bloch) Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 224, 1881 (Tonga; Samoa; Ponapé; Solomons).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma Island).

Head 3; depth 1 4/5; D. X, 17; A. II, 14; scales 41 in upper section of lateral line of which last 6 pores; 11 pores in lower section of lateral line to caudal base, of which fourth opposite last pore of upper section and 3 more pores out on caudal base; 7 scales above lateral line to spinous dorsal origin, 18 below; 21 predorsal scales; snout 3 in head from snout tip; eye 3 1/4; maxillary 3; interorbital 3.

Body strongly compressed, deeply ovoid. Caudal peduncle strongly compressed, least depth 1 7/8 in total head length. Head width 1 4/5. Snout obtuse, length 4/5 its width. Eye with hind pupil edge midway in head; diameter 1 in snout, 1 1/8 in interorbital. Mouth broad, gape short, mandible slightly protruded. Maxillary reaches about opposite front of eye, expansion 2 1/5 in eye. Teeth conic, pointed, uniserial, slightly larger in front of each jaw. Nostril very slightly behind middle in snout length. Interorbital broadly convex. Opercle, subopercle and suborbital edge spinescent; preopercle edge serrate. Gill rakers 5 + 12, lanceolate, slender, 1 1/2 in gill filaments, which 1 1/4 in eye.

Scales with 8 to 10 basal radiating striae; apical denticles in 57 or 58 series, basal elements in 8 to 10 transverse series; circuli very fine. Second dorsal spine 2 2/5 in total head length, tenth ray 1 2/3; second anal spine 3, first ray 2; caudal 1, truncated behind; pectoral 1 1/8; ventral 1.

Generally deep seal brown on trunk, head and caudal peduncle largely light brownish. Broad milk-white band

from predorsal, widens until hind eye edge, then narrows as it slopes down to branchiostegal region of chest, but not meeting its fellow below. Membranes of spinous dorsal deep dusky, spines brownish. Soft dorsal brownish. Anals and ventral blackish. Caudal pale yellowish. Pectoral pale brown. Iris pale brownish.

In the Bishop Museum 1 from Guam in 1923. Length 60 mm. Three in the National Museum from Apia.

Differs from *Amphiprion ephippium* in wider postocular band and trunk and tail largely, together with ventral and anal, dusky brown.

East Indies, Melanesia, Micronesia, Polynesia.

Amphiprion sebae Bleeker.

Amphiprion sebae Bleeker: Nat. Tijds. Ned. Ind., vol. 4, p. 478, 1853 (type loc., Batavia, Java).—Fowler: B. P. Bishop Mus., Bull. 22, p. 13, 1925 (Guam).

Head 3; depth 2; D. X, 16; A. II, 14; scales 46 in lateral line to caudal base; 6 scales above lateral line to spinous dorsal origin, 14 below; snout 3 2/3 to 4 in head from snout tip; eye 2 1/2 to 2 2/3; maxillary 3; interorbital 2 3/4 to 3 1/8.

Body oblong-ovate, well compressed. Least depth of caudal peduncle 1 4/5 to 1 7/8 in head. Head width 1 3/4 to 1 4/5 its length. Snout obtuse, convex, length half its width. Eye large, hind pupil edge midway in head length. Mouth moderate, lower jaw slightly protruding. Teeth conic, uniserial in jaws. Nostril single, close before eye on side of snout. Interorbital convex. Gill rakers 7 + 10, lanceolate, slender, 3/4 long as gill filaments, which half of eye.

Scales with 4 basal radiating striae; apical denticles 22 or 23, transversely in 4 series; circuli moderate. Lateral line complete, runs high along side of caudal peduncle to caudal base or little above upper third of its depth. Second dorsal spine 2 to 2 1/4 in total head length; second dorsal ray 1 7/8 to 2; second anal spine 2 1/8 to 2 1/5; third anal ray 1 5/6 to 1 7/8; caudal 1, rounded convexly behind; pectoral 1 to 1 1/8; ventral 1 to 1 1/8.

Generally blackish-brown. Muzzle pale to gray-white. Broad white band, little inclined, includes whole predorsal and slopes forward close to hind eye edge and narrowing below on chest, but not meeting its fellow. Another similar band from last dorsal spines and front of soft dorsal to vent, meets its fellow and entirely before anal fin. Caudal peduncle with transverse white band, little narrow below. Soft dorsal and caudal whitish. Anal and ventral black. Pectoral grayish-dusky. Iris dusky.

Two in the Bishop Museum 26 to 27 mm. from Guam, obtained in 1923. They agree largely with Day's figure (Fishes of India, pt. 3, p. 378, pl. 80, fig. 3, 1877).

Andamans, East Indies, Micronesia.

Amphiprion bifasciatus (Bloch).

Anthias bifasciatus Bloch: Nat. ausländischen Fische, pt. 6, p. 108, pl. 316, fig. 2, 1792 (type loc., Amboina).

Prochilus bifasciatus Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

Amphiprion bifasciatus Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 362, 1882 (New Guinea).

Amphiprion laticlavius Cuvier: Hist. nat. Poiss., vol. 5, p. 296, 1830 (type loc., New Guinea).—Schlegel and Müller: Nat. Ges. Zool., Verh., p. 18, 1839-44 (east coast of New Guinea).

Broad white postocular band, another from last dorsal spines and front of soft dorsal and sometimes third across caudal peduncle. Soft dorsal often largely white and pectoral pale. Hind caudal edge white, upper and lower hind corners broadly so. Length 125 mm. (Bleeker)

Reunion, India, Andamans, East Indies, Queensland.

Amphiprion percula (Lacépède).

Lutjanus percula Lacépède: Hist. nat. Poiss., vol, 4, pp. 194, 239, 1802 (type loc., Port Praslin, New Britain).

Amphiprion percula Cuvier: Hist. nat. Poiss., vol. 5, p. 298, 1830 (Port Praslin; Doreh Harbor, New Guinea; Borabora, Society Islands; New Ireland; Vanicolo).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 21, 1869 (Pelew Islands).—Günther: Cruise of "Curaçoa" (Brenchley), p. 410, 1873 (Solomons).—Peters: Akad. Wiss. Berlin, Monatsb., p. 843, 1876 (1877) (New Guinea).—Jouan: Soc. Cherbourg, Mem., vol. 21, p. 334, 1877-78 (on *Blennius* Jouan, op. cit., vol. 8, p. 253, no. 20, 1861, New Caledonia).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 225, pl. 124 A, 1881 (Solomons).—Weber: Siboga Exped., vol. 65, p. 335, 1913 (Atjatuning, west coast New Guinea).—Whitley: Australian Mus., Records, vol. 16, no. 1, p. 24, 1927 (Solomons; Duke of York Island; Line Islands; New Guinea).

Prochilus percula Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, pp. 281, 299, 1868 (Doreh, New Guinea; Waigiu).

Amphiprion tunicatus Cuvier: Hist. nat. Poiss., vol. 5, p. 299, pl. 132, 1830 (type loc., Vanicolo).—Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 192, pl. 25, fig. 3, 1830 (Port Praslin, New Ireland; Doreh, New Guinea).

Very similar to *Amphiprion bifasciatus* in coloration, but differs in having anterior dorsal spines much higher than posterior. According to Bleeker reaches 80 mm.

India, Andamans, Nicobar Islands, East Indies, China, Queensland, Melanesia, Micronesia, Polynesia.

Amphiprion perideraion Bleeker.

Amphiprion perideraion Bleeker: Nat. Tijds. Ned. Ind., vol. 9, p. 437, 1855 (type loc., Groot Obi).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 16, 1877 (Pelew Islands).

Amphiprion perideraeus Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 226, 1881 (Pelew Islands).

Golden or yellowish, body scales marked with many pearly dots. Narrow white band from predorsal down over front of opercles. Pearly line along bases of dorsal fins. Length 75 mm. (Bleeker)

East Indies, Micronesia.

Amphiprion rosenbergi Bleeker.

Amphiprion rosenbergi Bleeker: Nat. Tijds. Ned. Ind., vol. 20, p. 93, 1859-60 (type loc., New Guinea).

Amphiprion rosenbergii Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. (3) 16, 1859 (1860) (Doreh, New Guinea).

Rosy-golden or brownish-golden. Broad silvery band from occiput includes postocular and breast. Length 26 mm. (Bleeker)

East Indies. Possibly the young of *Amphiprion perideraion.*

Dascyllus trimaculatus (Rüppell).

Pomacentrus trimaculatus Rüppell: Atlas Reise Nord. Afrika, Fische, p. 39, pl. 8, fig. 3, 1828 (type loc., Massaua, Red Sea).

Dascyllus trimaculatus Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, pp. 3, 4, 1859 (Doreh, New Guinea).—Günther: Cat. fishes Brit. Mus., vol. 4, p. 13, 1862 (Louisiades; Aneiteum).—Schmeltz: Mus. Godeffroy,

Cat. 6, p. 16, 1877 (Yap).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 236, 1881 (Society Islands, Kingsmills, Pelew Islands, Yap, Louisiades, Aneiteum, Hawaiian islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 363, 1882 (New Guinea).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 503, 1901 (Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 16, 20, 1902 (Honolulu).—Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 131, 1902 (1903) (Marcus Island).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 290, 1905 (1906) (Pago Pago).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 298, 1911 (Jaluit, Marshalls; Suva, Fiji).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 28, 1925 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 38, p. 22, 1927 (Johnston Island, French Frigates Shoal, Honolulu).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 14, 1928 (Samoa, Hawaii, Honolulu, Jaluit, type of *D. albisella*).

Tetradrachmum trimaculatum Fowler: Acad. Nat. Sci. Philadelphia, p. 503, 1900 (Hawaii).—Weber: Siboga Exped., vol. 65, p. 356, 1913 (Atjatuning, west coast New Guinea).

Dascyllus albisella Gill: Acad. Nat. Sci. Philadelphia, Proc., p. 149, 1862 (type loc., Hawaiian islands).—Günther: Rept. voyage "Challenger," vol. 1, p. 61, 1880 (Honolulu).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 236, 1881 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 457 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 527, 1902 (1904) (Honolulu; French Frigates Shoal).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 266, 1903 (1905) (Honolulu; Waikiki Beach).—Gilbert: op. cit., vol. 23, pt. 2, p. 620, 1903 (1905) (French Frigates Shoal, 14½ to 16½ fathoms).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 66, Dec. 1922 (Hawaii).

In the National Museum 2 from New Guinea, 114 to 120 mm., also 2 young; 1 Samoa, 1 Jaluit, 18 Honolulu of which 6 from W. H. Pease and 4 others Hawaiian of which one type of *Dascyllus albisella*. The Bishop Museum has 2 from Honolulu, 1 Waikiki from W. A. Bryan, also 9 from same donor obtained at Honomuni on Molokai in July 1914; 1 Marcus Island, 2 Guam where called "danglun." In the Agassiz Museum 1 from Suva, 1 Marshall Islands from Rev. B. G. Snow, and remaining received from Andrew Garrett as 2 Apiang in Kingsmill Islands, 7 Society Islands, and 1 Hawaiian. In the Academy 18 Hawaiian from Thomas Nuttall, now discarded. Also very poor specimen 35 mm. long without caudal, from Oahu, obtained by W. H. Jones. It has the broad white blotch on middle of side extending over at least 6 to 8 scales.

The nominal *Dascyllus albisella* was separated by Jordan and Evermann from this species, though without good reason. All the materials before me show at least traces of the white vertical blotch, which more contrasted in the young. In alcoholic specimens the body appears to become uniform. I found but 4 fresh specimens in the Honolulu markets in November and December 1922.

Red Sea, East Africa, Mauritius, India, East Indies, Melanesia, Micronesia, Polynesia, Hawaii.

Dascyllus marginatus (Rüppell).

Pomacentrus marginatus Rüppell: Atlas Reise Nord. Afrika, Fische, p. 38, pl. 8, fig. 2, 1828 (type loc., Massaua, Red Sea).

Dascyllus marginatus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 17, 1928 (Hawaiian islands).

Dascyllus xanthosoma Bleeker: Soc. Sci. Ind. Neerl., no. 2, vol. 6, pp. 3, 4, 1859 (Doreh, New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 16, 1877 (Ponapé).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 237, pl. 124, fig. C, 1881 (Kandavu, New Britain, Ponapé).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma Island).

Tetradrachmum xanthosoma Whitley: Australian Mus., Records, vol. 16, no. 1, p. 17, 1927 (New Hebrides).

Pomacentrus unifasciatus Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, p. 348, pl. 8, fig. 24, 1868 (type loc., Kandavu, Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 21, 1869 (Kandavu).

Dascyllus reticulatus Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 363, 1882 (New Guinea).

Gliphidodon bimaculatus Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 271, 1883 (type loc., southeast coast of New Guinea).

Distinguished from *Dascyllus trimaculatus* by its general pale coloration. Spinous dorsal and ventrals dusky. Small black spot at pectoral origin. Reaches 140 mm.

The National Museum has 3 without locality, likely from Fiji or Samoa?, obtained by the Wilkes Expedition.

The account of *Gliphidodon bimaculatus* seems to me to have been intended for the young. It is briefly noticed as follows: Depth 2 in total; D. XII, 11; A. II, 12; scales 26. Eyes large, close to snout, diameter apart. Mouth very small. Silvery-gray, black spot above and below root of tail. Ends of dorsals and anals blackish. Length 37 mm.

Red Sea, Mauritius, Madagascar, India, Andamans, East Indies, China, Melanesia, Micronesia, Polynesia.

Dascyllus melanurus Bleeker.

Dascyllus melanurus Bleeker: Nat. Tijds. Ned. Ind., vol. 6, p. 100, 1854 (type loc., Neira, Banda).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, pp. 3, 4, 1859 (Doreh, New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 16, 1877 (Yap).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 236, pl. 124, fig. C, 1881 (Ponapé).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 55, 1906 (Shortland Island).

Tetradrachmum melanurus Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 281, 1868 (Doreh, New Guinea).

Pomacentrus onyx DeVis: Linn. Soc. New South Wales, Proc., vol. 8, p. 451, 1883 (type loc., South Seas).

Head 2 4/5 to 3; depth 1 3/4 to 1 4/5; D. XII, 12, 1; A. II, 12, 1; tubes 16 in upper arch of lateral line and 7 to 9 pores in straight section; 3 or 4 scales above lateral line, 9 below; 24 predorsal scales; snout 3 2/3 to 4 in head measured from upper jaw tip; eye 2 2/3 to 2 5/6; maxillary 3 to 3 1/8; interorbital 2 1/2 to 2 2/3. Least depth of caudal peduncle 2 to 2 1/10 in total head length.

Head width 1 3/4 to 1 4/5 in its length. Snout very

short, obtuse, in profile half of eye or length 3/5 its width. Bands of simple conic teeth in jaws. Hind preopercle and lower infraorbital edge denticulate. Gill rakers 7 + 14, lanceolate, equal gill filaments or about 2 in eye. Scales with 7 basal radiating striae; apical denticles 70 to 101, basal elements in single series; circuli fine. First dorsal spine 3 or 4 in head; fourth spine 1 1/2 to 1 3/5; sixth dorsal ray 1 1/3 to 1 2/5; second anal spine 1 3/4 to 2; fourth anal ray 1 1/2 to 1 3/5; caudal 1 1/10 to 1 1/6; pectoral 1 1/10 to 1 1/6; ventral 1.

Four black transverse bands, little narrower than whitish interspaces. First embraces all of mandible and infraorbital except lips. Third embraces edges of last dorsal and anal, rays white. Fourth includes terminal and greater part of caudal. Pectoral pale. Ventral black. Length 37 to 52 mm.

Three in the Bishop Museum from Shortland Island.

East Indies, Melanesia, Micronesia.

Dascyllus aruanus (Linné).

Chaetodon aruanus Linné: Systema nat., 10th ed., p. 275, 1758 (type loc., Indies).

Dascyllus aruanus Cuvier: Hist. nat. Poiss., vol. 5, p. 325, 1830 (Bolabola; Tongatabu; Oualan; Guam; New Ireland).—Thiollière: Fauna Woodlark, p. 199, 1857 (Woodlark Island).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, pp. 3, 4, 1859 (Doreh, New Guinea).—Günther: Cat. fishes Brit. Mus., vol. 4, p. 12, 1862 (Fiji; Tongatabu; Tonga).—Kner: "Novara" Fische, p. 241, 1865 (Tahiti).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 21, 1869 (Viti; Pelew Islands; Samoa).—Günther: Cruise of "Curaçoa" (Brenchley), p. 410, 1873 (Solomons).—Streets: U. S. Nat. Mus., Bull., no. 7, p. 97, 1877 (Samoa).—Peters: Akad. Wiss. Berlin, Monatsb., p. 843, 1876 (1877) (Fiji).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 235, pl. 124, fig. B, 1881 (South Seas).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 362, 1882 (New Guinea).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma Island).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 229, 1898 (Mariannes).—Garman: Mus. Comp. Zool., Bull., vol. 39, p. 238, 1903 (Suva, Fiji).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 55, 1906 (Faté; Nukuhiva; Shortland Island; Raiatea).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1395, 1906 (Upolu; Savaii).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 290, 1905 (1906) (Samoa).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 612, 1908 (Suva, Fiji).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 298, 1911 (Jaluit, Marshalls; Fakarava, Paumotus; Papeete, Tahiti).—Kendall and Radcliffe: op. cit., vol. 35, p. 136, 1912 (Mangareva).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 121, 1922 (Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 14, 34, 38, 1925 (Guam; Samoa; Tahiti).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 20, 1925 (Wake Island).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 21, 1928 (Samoa, New Guinea, Tahiti, Apia, Mangareva, Fakarava, Pago Pago).

Tetradrachmum aruanum Waite: Australian Mus., Mem., no. 3, p. 191, 1897 (Funafuti, Ellice Islands).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 84, 1900 (Guam).

Pomacentrus emamo Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 190, 1830 (type loc., Borabora, Society Islands).

Pimeleptere ? simunad (Montrouzier) Thiollière: Fauna Woodlark, p. 199, 1857 (name in synonymy).

Tetradrachmum arcuatum Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).

Pomacentrus trifasciatus (non Rüppell) DeVis: Linn. Soc. New South Wales, Proc., vol. 8, p. 452, 1883 (type loc., probably South Sea Islands).

Pomacentrus devisi Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 284, 1905 (1906) (on DeVis).

In the National Museum 15 specimens, mostly without data except 1 from Tonga, several others likely from Fiji or Samoa, obtained by the Wilkes Expedition. Others are series from Samoa from Steinberger, series from Apia, 20 Mangareva, 2 New Guinea, 2 Fakarava, 3 Tahiti from the British Museum. Largest 80 mm. The Bishop Museum has 40 Agaña on Guam, 2 Faté, 1 Shortland Island, 2 Nukuhiva, 10 Raiatea, 25 Palmyra Island obtained in 1922 by Thurston and Thaanum. Six from Guam in 1923. Also 19 from Wake Island. In the Agassiz Museum 36 from Society Islands from Andrew Garrett, in the Marshall Islands 12 from Rev. B. G. Snow and 57 from Rev. A. A. Strong April 14, 1877, 20 Mangareva, 24 Apia, 3 Pelew Islands from R. Tomes, November 2, 1869, 6 Apiang in the Kingsmill Islands from Andrew Garrett, 1 Suva in Fiji, 2 Ponapé on Ascension Island in August 1860 by Rev. L. H. Gulick, 1 Jaluit. In the Academy 42 from Tahiti, 21 Apia, 3 Pago Pago, 1 "Victoria, Australia" doubtless from Fiji?.

Pomacentrus emamo Lesson is likely intended for this species. It is described from a specimen 50 mm. long, with nearly orbicular body, but the dark transverse bands are described as blue. Caudal said to be blue edged with white. *Pomacentrus trifasciatus* of De Vis is more surely this species.

Red Sea, East Africa, Mauritius, India, East Indies, Queensland, China, Melanesia, Micronesia, Polynesia, Hawaii.

Acanthochromis polyacanthus (Bleeker).

Dascyllus polyacanthus Bleeker: Nat. Tijds. Ned. Ind., vol. 9, p. 503, 1855 (type loc., Batjan).

Acanthochromis polyacanthus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 55, 1906 (Faté, New Hebrides).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 18, p. 206, 1912 (Port Sandwich, New Hebrides).

Abudefduf jordani Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 53, fig. 2, 1906 (type loc., Shortland Island, Solomons).

Readily known by the increased dorsal or anal spines, 16 or 17 in number.

Type and 5 paratypes of *Abudefduf jordani*, besides 1 from Shortland Island and 1 from Faté, New Hebrides, in the Bishop Museum. Largest 138 mm. Agrees in every way except it shows a number of blackish spots as shown in Bleeker's figure. Its variants have given rise to several other synonyms.

East Indies, Melanesia.

Chromis ternatensis (Bleeker) (fig. 52).

Heliastes ternatensis Bleeker: Nat. Tijds. Ned. Ind., vol. 10, p. 377, 1856 (type loc., Ternate).—Bleeker: Soc.

Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).

Chromis ternatensis Steindachner: Akad. Wiss. Wien. Sitz., vol. 115, pt. 1, p. 1397, 1906 (Samoa).

Chromis caeruleus (non Cuvier) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 55, 1906 (Shortland Island).

Head 3 1/8 to 3 1/2; depth 1 5/6 to 1 7/8; D. XII, 11, 1; A. II, 11; tubes 14 to 17 in upper arch of lateral line, followed by 4 pores; 8 or 9 pores in horizontal section to caudal base, and 2 or 3 more on latter; 3 scales above lateral line, 9 below; 26 to 28 predorsal scales; snout 3 2/5 to 3 3/5 in head measured from upper jaw tip; eye 3; maxillary 3 to 3 1/2; interorbital 2 3/5 to 2 4/5.

Body with back elevated, slightly more arched upper profile than lower. Least depth of caudal peduncle 1 7/8 to 2 in head. Head width 1 4/5 to 2 in its length. Snout length about 2/3 to 4/5 its width. Maxillary extends slightly beyond nostril, not quite to eye. Teeth conic, in narrow bands, at least in front of jaws, but with outer series little larger than others. Suborbital half of eye, its edge, together with that of infraorbital and preopercle, entire. Gill rakers 8 + 23, lanceolate, 4/5 of gill filaments or 3 in eye. Scales with 8 or 9 basal radiating striae, with 1 or 2 auxiliaries; apical denticles 127 to 170, basal elements in 2 to 5 series; circuli fine. First dorsal spine 3 to 3 1/3 in head; last spine 2 2/5 to 2 1/2; sixth dorsal ray 1 1/3; second anal spine 2 1/3 to 2 3/5; sixth anal ray 1 1/3 to 1 1/2; caudal with each lobe ending in short filament, little longer than head; pectoral little longer than head; ventral 1 to 1 1/10.

Back and upper surface dark brown. Dorsals more or less tinged with dusky, also upper and lower edges of caudal lobes, latter in strong contrast. Other fins pale. Iris slaty. Length 90 to 98 mm.

Three in the Bishop Museum from Shortland Island.

East Indies, Philippines, Melanesia, Polynesia.

Chromis dimidiatus (Klunzinger).

Heliastes dimidiatus Klunzinger: Zool. Bot. Ges. Wien, Verh., vol. 21, p. 529, 1871 (type loc., Koseir, Red Sea).—Günther: Mus. Godeffroy, Jour., vol. 7, pt 15, p. 237, pl. 125, fig. B, 1881 (Tahiti; Raiatea).

Chromis dimidiatus Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 20, 1925 (Johnston and Wake islands, French Frigates Shoal).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 45, 1928 (type of C. leucurus and *C. iomelas;* Pago Pago).

Gliphidodon bicolor Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 365, 1882 (type loc., New Guinea).

Chromis leucurus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 620, pl. 77, fig. 2, 1903 (1905) (type loc., Avau Channel, between Maui and Lanai in 34 to 65 fathoms; near Kauai in 40 to 233 fathoms).

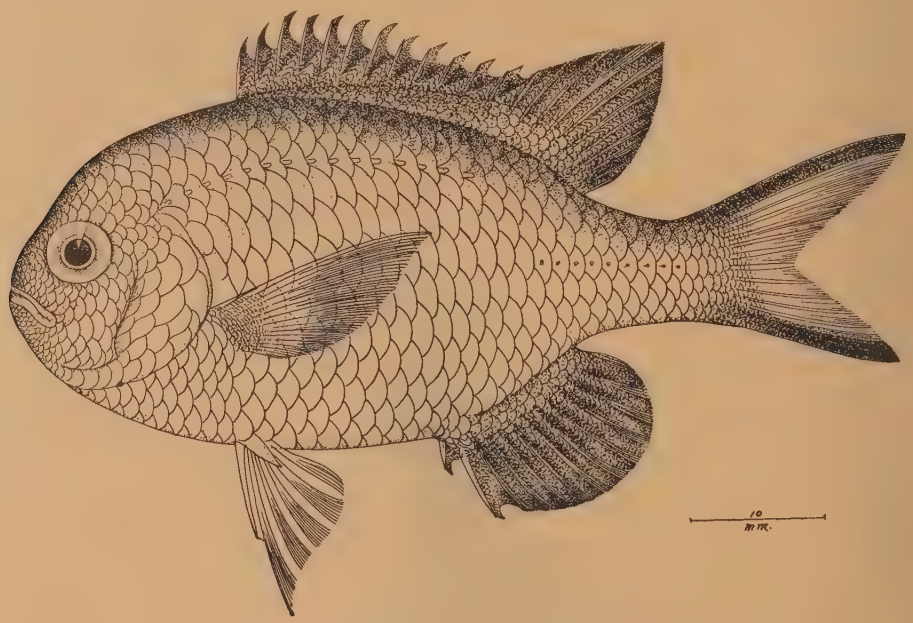

FIGURE 52.—Drawing of *Chromis ternatensis.*

Chromis iomelas Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 292, 1905 (1906) (type loc., Pago Pago, Samoa).

Chromis isomelas Fowler and Silvester: Carnegie Inst., Marine Biol. Pap., p. 121, 1922 (Pago Pago) (err. typog.).

Head 3 2/5 to 3 1/2; depth 1 5/6 to 2 1/8; D. XII, 13, 1; A. II, 12, 1 or 13, 1; tubes 15 or 16 in upper arch of lateral line, pores 8 to 10 in straight section to caudal base with 1 more on later; snout 3 3/4 to 4 in head; eye 2 1/3 to 3; maxillary 3 to 3 2/5; interorbital 2 1/2 to 2 3/5. Least depth of caudal peduncle 1 7/8 in head. Head width 1 4/5 in its length. First dorsal spine 4 1/10 in head; last spine 2 1/10; fifth dorsal ray 1 1/10; second anal spine 2 1/10; seventh anal ray 1 1/5; caudal 2 in combined head and trunk; pectoral 3; ventral 2 7/8.

In the Bishop Museum 3 from Honolulu 72 to 104 mm. Also 1 from Palmyra Island, obtained by Thurston and Thaanum in 1922 and 50 mm. There can be little doubt but that *Chromis leucurus* and *Chromis iomelas* are simply variants of this species. The Palmyra specimen has all the anterior half of the body dusky-brown, exactly as in Gunther's figure. The pectoral is pale as in *Chromis leucurus,* also with base and axil black, whereas Gilbert shows it pale with the front edge dark. Also 1 from

Johnston Island, 3 Wake Island, 1 French Frigates Shoal. Type of *Chromis leucurus* in the National Museum. Two in the Academy from Pago Pago.

There is little doubt but that *Gliphidodon bicolor* is a synonym.

Red Sea, East Indies, Polynesia, Hawaii.

Chromis analis (Cuvier).

Heliases analis Cuvier: Hist. nat. Poiss., vol. 5, p. 372, 1830 (type loc., Amboina).

Heliastes analis Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 366, 1882 (New Guinea).

A well marked species, with the long second anal spine but little shorter than the head.

East Indies, China, Melanesia.

Chromis caeruleus (Cuvier).

Heliases caeruleus Cuvier: Hist. nat. Poiss., vol. 5, p. 372, 1830 (type loc., New Guinea; Ulea).

? Cantharus caeruleus Valenciennes: Hist. nat. Poiss., vol. 6, p. 256, 1830 (type loc., Guam).

Chromis caeruleus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 290, pl. 44, fig. 1, 1905 (1906) (Apia; Pago Pago).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 612, 1908 (Suva; Fiji).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 299, 1911 (Taritari, Gilberts; Kusaie, Carolines; Fakarava, Paumotus).—Kendall and Radcliffe: op. cit., vol. 35, p. 136, 1912 (Mangareva, Paumotus).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 121, 1922 (Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 14, 34, 1925 (Guam; Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 20, 1925 (Wake Island).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 61, 1928 (Tari Tari, Samoa, Fiji, Mangareva, Kusaie, Pago Pago).

Heliases lepisurus Cuvier: Hist. nat. Poiss., vol. 5, p. 373, 1830 (type loc., New Guinea).—Boulenger: Ann. Mag. Nat. Hist. London, 6th. ser., vol. 20, p. 373, 1897 (Rotuma Island).

Heliastes lepidurus Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Samoa).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 238, pl. 128, figs. C-D, 1881 (Samoa; Pelew Islands; Paumotus; Yap; Kingsmills).—Ogilby: Australian Mus., Records, vol. 1, p. 7, 1890-91 (Howla Island, Shortland Island, Solomons).

Chromis lepidurus Streets: U. S. Nat. Mus., Bull., no. 7, p. 97, 1877 (Samoa).

Chromis lepisurus Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1397, 1906 (Upolu).—Whitley: Australian Mus., Records, vol. 16, no. 1, p. 24, 1927 (Dauco Island reef off Port Moresby, New Guinea; Howla Island, Solomons; Vavau, Friendly Islands; Aneiteum, New Hebrides).

Heliases frenatus Cuvier: Hist. nat. Poiss., vol. 5, p. 373, 1830 (type loc., Guam).

Heliastes frenatus Elera: Cat. fauna Filipinas, vol. 1, p. 548, 1895 (Mariannes).

Lutianus erythropterus (non Bloch) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 78, 1900 (Guam; part).

Abudefduf amboinensis (non Bleeker) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 84, 1900 (Guam).

Chromis axillaris (non Bennett) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 55, 1906 (Raiatea, Society Islands).

In the National Museum 4 without locality, doubtless from somewhere in Polynesia as Fiji or Samoa?, obtained by the Wilkes Expedition. Others, 6 young from Samoa obtained by Steinberger, series from Apia, 26 Mangareva, 4 Kusaie, 21 Taritari. The Bishop Museum has 3 Raiatea and 16 from Agaña on Guam. Also 34 from Guam in 1923. The Agassiz Museum with 5 Mangareva, 20 Fakarava and 30 Pago Pago. In the Academy 31 from Pago Pago.

Red Sea, Zanzibar, Mauritius, East Indies, Melanesia, Micronesia, Polynesia.

Chromis cupreus Fowler and Bean.

Chromis cupreus Fowler and Bean: U. S. Nat. Mus., Proc., vol. 63, p. 22, 1923 (type loc., Fiji or Samoa?).

Known only from the type in the National Museum.

Chromis ovalis (Steindachner).

Heliastes ovalis Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 502, 1901 (type loc., Honolulu).

Chromis ovalis Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 458, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 269, 1903 (1905) (Jenkins material).—Fowler: B. P. Bishop Mus., Bull. 22, p. 28, 1925 (Honolulu).

Furcaria ovalis Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 67, 1922 (Hawaii).

Chromis velox Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 393, fig. 6, 1899 (1901) (type loc., Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 19, 1902 (Honolulu).

In the National Museum 1 without definite locality, likely from Maui, obtained by the Wilkes Expedition. Also type of *Chromis velox* from Honolulu. The Bishop Museum has 6 from Honolulu. I examined 40 in the Honolulu markets in November and December 1922. Two Hawaiian specimens in the Agassiz Museum obtained by Andrew Garrett.

Chromis sindonis (Jordan and Evermann).

Glyphisodon sindonis Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 188, 1902 (1903) (type loc., Honolulu; Kailua).—Jordan and Evermann: op cit., vol. 23, pt. 1, pl. 40, 1903 (1905) (types).

Abudefduf sindonis Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 272, 1902 (1903) (types).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).

Abudefduf limbatus (non Cuvier) Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 504, 1900 (Hawaii).

One in the Academy from Hawaii, collected by J. K. Townsend. Dried skin, 111 mm. Type of *Glyphisodon sindonis* in the National Museum. Its teeth in a single series, slender, pointed, conic, simple.

A re-examination of the specimen I reported as *Abudefduf limbatus* shows the characters as set forth in my description. Jordan and Evermann have questioned my specimen as probably not Hawaiian, and incorrectly as belonging to *Abudefduf imparipennis* (Vaillant and Sauvage). This last species differs at once in the soft dorsal rays. Though the color is faded in the Townsend specimen, there are very faint indi-

cations of the 2 pale vertical bars as shown in Jordan and Evermann's figure of *Glyphisodon sindonis*.

Chromis verater Jordan and Metz (Pl. XXXVI, *C*).

Chromis verater Jordan and Metz: U. S. Nat. Mus., Proc., vol. 42, p. 527, pl. 71, fig. 2, 1912 (type loc., Honolulu).—Fowler: B. P. Bishop Mus., Bull. 38, p. 22, 1927 (Honolulu).

Chronis verater E. K. Jordan: U. S. Nat. Mus., Proc., vol. 66, p. 25, 1925 (Honolulu).

Head 3 2/5 to 3 1/2; depth 1 4/5 to 1 7/8; D. XIV, 13, 1; A. II, 13, 1 or 14, 1; tubular scales in lateral line 19, pores in straight section 9 or 10; 5 scales above lateral line to spinous dorsal origin, 10 or 11 below; 24 to 28 predorsal scales, not quite extending forward to snout tip; 4 rows of cheek scales; infraorbital not distinct; snout 3 7/8 to 4 in head; eye 3 1/6 to 3 1/4; maxillary 2 4/5 to 3 1/5; interorbital 2 3/4 to 2 4/5. Gill rakers 10+21, lanceolate, little shorter than gill filaments. Scales with 9 basal radiating striae; apical denticles 186 and basal elements in 6 transverse series; circuli very fine. First dorsal ray simple.

Dark or swarthy brown. Vertical fins all dusky-brown. Pectoral paler or olive-brown, base contrasted with dusky, though without defined blackish blotch and axil dark. Ventral dusky. Length 187 mm.

Besides the type, in the National Museum, 1 in the Bishop Museum obtained in the Honolulu market by John W. Thompson, October 28, 1925, the type used in the above note. I also compared it with National Museum specimens of *Chromis cinerascens*, though no large ones available. Bleeker had 27 specimens, but his largest was only 121 mm. *Chromis cinerascens* appears to have much lighter fins, a more emarginate caudal and the pectoral base conspicuously paler. I found 150 of *C. verater* in the Honolulu markets in 1922 and 1923.

Though Jordan and Metz state there is "a large obscure round pale light spot at the base of last rays of dorsal and anal" these are not indicated at all in the figure, nor is the pale median one at the caudal base noticed. They are well shown in the Honolulu specimens before me and in an accompanying sketch sent by Stanley C. Ball. It also gives the iris dusky blue and a bluish white circle around the pupil.

Pomacentrus pavo (Bloch).

Chaetodon pavo Bloch: Nat. ausländischen Fische, pt. 3, p. 60, pl. 198, 1787 (type loc., East Indies).

Pomacentrus pavo Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, pp. 3, 4, 1859 (Doreh, New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 21, 1869 (Samoa).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 227, pl. 124, fig. E, 1881 (Tahiti; Ponapé; Bonham Islands).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma Island).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1397, 1906 (Upolu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 279, pl. 40, fig. 1, 1905 (1906) (Apia; Pago Pago).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, pt. 1, p. 52, 1906 (Shortland Island; Raiatea).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 14, 34, 1925 (Guam; Samoa).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 68, 1928 (Apia and Tari Tari).

Pomacentrus (*Pomacentrus*) *pavo* Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 295, 1911 (Makemo, Paumotus; Taritari, Gilberts).

Pomacentrus ? furcatus Thiollière: Fauna Woodlark, p. 201, 1857 (type loc., Woodlark Island).

Pomacentrus notatus De Vis: Linn. Soc. New South Wales, Proc., vol. 8, p. 451, 1883 (type loc., New Britain).

Pomacentrus littoralis (non Cuvier) Seale: B. P. Bishop Mus., Occ. Pap., vol. 1, no. 3, p. 81, 1900 (1901) (Guam).

Head 2 7/8 to 3 1/8; depth 2 1/3 to 2 2/5; D. XIII, 13, 1; A. II, 13, 1; tubes 15 to 18 in upper arch of lateral line, pores 10 in straight section; 3 scales above lateral line, 9 below; 13 predorsal scales; snout 3 7/8 to 4 in head; eye 2 1/3 to 2 3/4; maxillary 3 to 3 1/4; interorbital 2 1/2 to 3 1/3.

Head width 1 3/4 to 1 4/5 in its length. Snout convex, length 2/3 its width. Eye large, hind pupil edge midway in head length. Maxillary reaches opposite eye. Teeth uniserial, compressed, incisor-like. Interorbital broadly convex. Suborbital edge finely jagged, blunt spine forward below. Hind preopercle edge serrate, lower edge entire. Gill rakers 8+14, lanceolate equal gill filaments or 2 2/5 in eye. Scales with 7 to 9 marginal basal striae; apical denticles 42 to 88, basal elements in 3 or 4 series; circuli very fine.

Bright blue generally, each scale with submarginal vertical dusky line. On head, back above lateral line and lower surface of body usually with bright blue spots. Black blotch on opercle half size of pupil. Two blue lines from snout tip to eye, upper along upper eye edge and on eye, lower across eye. Blue line follows from maxillary along lower eye edge and 2 others parallel across cheek. Fins, abdomen and breast all more or less pale brownish. Dorsal edges above narrowly dusky. Scales on dorsals basally bluish.

Some examples show blue spots on head more or less continuous to form lines and very small spots on small interorbital scales. Other examples with body more brownish, blue spots less distinct, spinous dorsal and front half of soft dorsal dusky-black, also anal dusky, though in all caudal pale. Length 29 to 59 mm.

In the Academy 12 from Apia. The National Museum has several from Apia and 2 from Taritari. In the Bishop Museum 3 Shortland Island, 6 Raiatea, and 1 Agaña on Guam; also 1 from Guam in 1923. The Agassiz Museum has 1 Makemo, 10 Apia, and 9 Society Islands, specimens obtained by Andrew Garrett.

Red Sea, East Africa, East Indies, Melanesia, Micronesia, Polynesia.

Pomacentrus vaiuli Jordan and Seale.

Pomacentrus vaiuli Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 280, pl. 40, fig. 2, 1905 (1906) (type loc., Apia; Pago Pago).

A brilliant species somewhat like *Pomacentrus pavo* but with the general colors reversed, back and upper surface yellowish, lower surfaces, breast, abdomen, ventral and anal fins purplish. Also black ocellus at bases of last anal rays. Reaches 70 mm.

Type in the National Museum.

Pomacentrus taeniurus Bleeker.

Pomacentrus taeniurus Bleeker: Soc. Sci. Ind. Neerl., Act. (Amboina), vol. 1, p. 51, 1856 (type loc., Am-

boina).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 52, 1906 (Tahiti; Faté).

Pomacentrus cyanomus Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 364, 1882 (New Guinea).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 18, p. 206, 1912 (Port Sandwich, New Hebrides).

Head 3 1/3; depth 2 1/3; D. XIII, 13, 1; A. II, 12, 1; tubes 17 in upper arch of lateral line and 8 pores in straight section to caudal base, 1 more on latter; 3 scales above lateral line, 9 below; 16 predorsal scales; snout 3 4/5 in head; eye 2 3/4; maxillary 3; interorbital 3 1/2. Least depth of caudal peduncle 1 5/6 in head.

Head width 1 3/5 in its length. Snout obtusely convex, length half its width in profile. Maxillary oblique, reaches opposite eye. Teeth uniserial. Preorbital edge, also hind preopercle edge, rather coarsely denticulate. Interorbital broadly convex. Gill rakers 8+14, lanceolate, slender, equal gill filaments or 2 1/2 in eye. Scales with 8 or 9 basal radiating striae; apical denticles 98 to 100, basal elements in 1 or 2 series; circuli fine. First dorsal spine 3 in head; last spine 1 7/8; eighth dorsal ray 1 1/8; second anal spine 1 3/5; sixth anal ray 1 1/3; caudal little longer than head; pectoral 1; ventral 1.

Dull brownish generally. Spinous dorsal irregularly dusky, also upper front half of soft dorsal. Likewise lower front half of soft anal and all spinous anal. Rest of dorsal and anal, also caudal and paired fins dull brown. Black opercular spot superiorly, little smaller than pupil. Traces of blue spots on scales of back and head above. Length 44 to 62 mm.

Three in the Bishop Museum from Tahiti.

East Indies, Australia, Japan, Melanesia, Polynesia.

Pomacentrus littoralis Cuvier.

Pomacentrus littoralis (Kuhl and Van Hasselt) Cuvier: Hist. nat. Poiss., vol. 5, p. 318, 1830 (type loc., Java).

Pomacentrus hogoleuensis Hombron and Jacquinot: Voyage "Astrolabe" et "Zelee," Zool., vol. 3, p. 47, pl. 5, fig. 3, 1853 (type loc., Hogoleu, Carolines).

Pomacentrus moluccensis Bleeker: Nat. Tijds. Ned. Ind., vol. 4, p. 118, 1853 (type loc., Amboina; Ternate).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, pp. 3, 4, 1859 (Doreh, New Guinea).—Peters: Akad. Wiss. Berlin, Monatsb., p. 843, 1876 (1877) (New Guinea).

Pomacentrus (*Pseudopomacentrus*) *moluccensis* Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

A very variable species, usually with a deep notch and large spine on the preorbital, suborbital and preopercle edges strongly serrate. Coloration dull, with small dark suprascapular spot.

Mauritius, East Indies, Melanesia, Micronesia.

Pomacentrus melanopterus Bleeker.

Pomacentrus melanopterus Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 562, 1852 (type loc., Amboina).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, pp. 3, 4, 1859 (1860) (Doreh, New Guinea).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 281, 1905 (1906) (Apia).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 120, 1922 (Pago Pago).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 80, 1928 (Samoa, Apia, Pago Pago).

Pomacentrus (*Pseudopomacentrus*) *melanopterus* Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

Pomacentrus analis Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 364, 1882 (type loc., New Guinea).

A strongly marked species, with large black blotch always covering pectoral base. Variably pale to melanistic. Reaches 100 mm.

In the National Museum 5 from Apia. One in the Academy from Pago Pago. According to Bleeker *Pomacentrus brachialis* Cuvier (Hist. Nat. Poiss., vol. 5, p. 314, 1830, type loc., D'Entrecasteaux Group and Java) is likely a composite, though I think the D'Entrecasteaux specimen may be a variant of *P. melanopterus*. It is described as oblong, narrow suborbital not denticulate, dorsal spines 12, reddish brown with a black spot at outer base of pectoral and length 77 mm.. Likely *Pomacentrus analis* is a synonym. It is described with a single anal spine, greenish-yellow with darker back, pectoral base, front anal and ventral rays black. Length 77 mm.

Mauritius, East Indies, Riu Kiu, Melanesia, Polynesia.

Pomacentrus tripunctatus Cuvier (fig. 53).

Pomacentrus tripunctatus Cuvier: Hist. nat. Poiss., vol. 5, p. 315, 1830 (type loc., Vanicolo).

Chaetodonton chrysuri Gmelin: Systema nat. Linné, p. 1268, 1789 (on Broussonet).

Chaetodon chrysurus (Broussonet) Cuvier: Hist. nat. Poiss., vol. 5, p. 317, 1830 (name in synonymy).

Pomacentrus chrysurus Cuvier: Hist nat. Poiss., vol. 5, p. 317, 1830 (type loc., South Sea).—Kittlitz: Denkw. Reise Mikronesien, vol. 2, p. 1611, 1858 (Ulea).

Pomacentrus vanicolensis Cuvier: Hist. nat. Poiss., vol. 5, p. 316, 1830 (type loc., Vanicolo).

Pomacentrus emarginatus Cuvier: Hist. nat. Poiss., vol. 5, p. 316, 1830 (type loc., Waigiu).—Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 189, pl. 28, fig. 1, 1830 (Waigiu).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, pp. 3, 4, 1859 (Doreh, New Guinea).

Pomacentrus marginatus Schlegel and Müller: Nat. Ges. Zool., Verhand., p. 20, 1839-44 (on Cuvier and Lesson).

Pomacentrus taeniometopon Kner: Akad. Wiss. Wien., Sitz., vol. 57, pt. 1, p. 348, 1868 (Kandavu, Fiji).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 32, 1874 (Kandavu).

Pomacentrus trilineatus Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma Island).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 127 (Majalibit Bay, Waigiu).

Pomacentrus littoralis (non Cuvier) Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 228, 1881 (Carolines; Society Islands).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 81, 1900 (1901) (Guam).

Pomacentrus bankanensis Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 81, 1900 (1901) (Guam).

Pomacentrus wardi Whitley: Australian Mus., Records, vol. 16, no. 1, p. 17, 1927 (German New Guinea).

Head 3 1/2; depth 2; D. XIII, 15, 1; A. II, 15, 1; tubes 18 in upper arch of lateral line and 7 pores in straight section to caudal base, 2 more on latter; 3 scales above lateral line, 9 below; 23 predorsal scales; snout 3 1/4 in head; eye 3; maxillary 3 1/2; interorbital 3 1/5. Least depth of caudal peduncle 1 7/8 in head. Head width 1 3/4 in its length. Gill rakers 8 + 12, lanceolate, nearly equal gill filaments or 2 1/2 in eye. Scales with 8 or 9 basal radiating striae, edge scalloped;

apical denticles 134 to 143, basal elements in 1 or 2 series; circuli very fine. First dorsal spine 4 1/5 in head; last spine 1 2/5; seventh dorsal ray 1 1/5; second anal spine 1 2/3; sixth anal ray 1 1/5; caudal little longer than head; pectoral 1; ventral 1 1/8.

Brown generally, each scale with blue spot or dot. Two blue lines on front converge at snout tip and extend up on back where breaking into blue spots. Also 2 or 3 similar lines through eye. Head becoming uniformly dotted or spotted with blue with age. Blue-black ocellus on opercle above, little less than pupil.

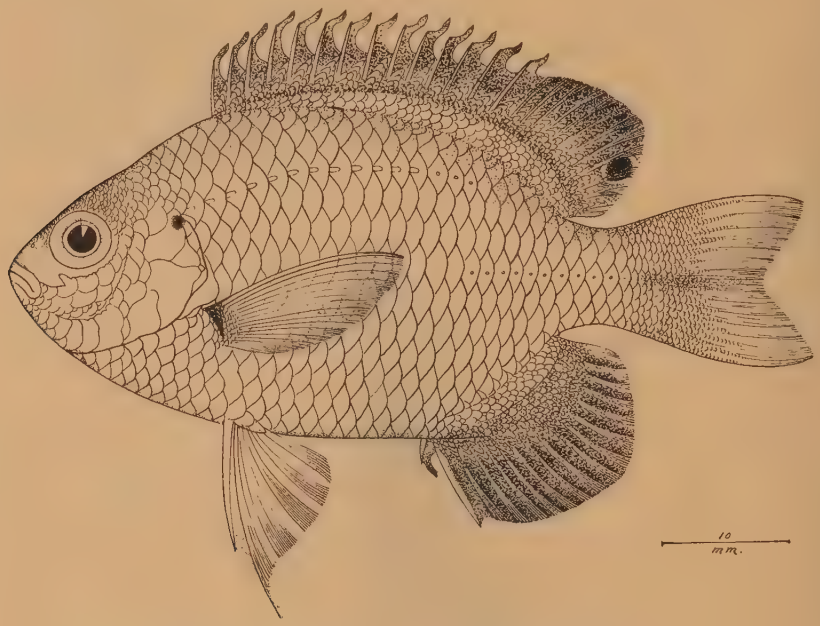

FIGURE 53.—Drawing of *Pomacentrus tripunctatus.*

Another, large as pupil, with pale blue edge on median dorsal rays basally. Caudal and pectoral very pale brown, ventral little more brownish. Length 38 to 177 mm.

In the Bishop Museum 1 from Faté, 8 from Agaña, Guam, 42 to 107 mm.

Lesson's plate shows a brown fish except that the front of the spinous dorsal is not blackish and there is no black blotch at the pectoral origin as in *Pomacentrus inornatus.* Lesson thought his specimen discolored. He described it entirely brown in alcohol, the caudal yellow and pectoral base clear. Hombron and Jacquinot describe *Pomacentrus hogoleuensis* uniform greenish, spinous dorsal gray, soft dorsal and anal violet, pectoral and ventral yellowish and caudal olive. Length 90 mm.

The species is extremely variable, from yellow to very dark or dusky. It variably shows very numerous small pale-blue dots on the body, often 2 blue or white lines over the eye toward dorsal, sometimes a small black spot at the pectoral origin or a blue suprascapular scale and frequently 2 white longitudinal parallel lines along front of anal.

Red Sea, Mauritius, East Indies, China, Riu Kiu, Australia, Melanesia, Micronesia, Polynesia.

Pomacentrus perspicillatus Cuvier.

Pomacentrus perspicillatus Cuvier: Hist. nat. Poiss., vol. 5, p. 313, 1830 (no type locality).

Pomacentrus trimaculatus (non Rüppell 1828) Cuvier: Hist. nat. Poiss., vol. 5, p. 320, 1830 (type loc., Batavia, Java).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 227, 1881 (Pelew Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 363, 1882 (New Guinea).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 34, 1885 (Rubi, New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 80, 1900 (1901) (Guam).

Pomacentrus dorsomaculatus Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 298, 1911 (on Cuvier).

In the Bishop Museum small specimen 63 mm. long from Guam. Now nearly spoiled so that no further details can be given. Three in the National Museum from New Guinea. Length 133 to 184 mm.

India, East Indies, China, Micronesia.

Pomacentrus notophthalmus Bleeker.

Pomacentrus notophthalmus Bleeker: Nat. Tijds. Ned. Ind., vol. 4, p. 137, 1853 (type loc., Ternate).—Weber: Zool. Forsch. Australien (Semon), vol. 5, p. [111] 271, 1895 (coast of New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 52, 1906 (Faté, New Hebrides).

Pomacentrus montrouzieri Thiollière: Fauna Woodlark, p. 200, 1857 (type loc., Woodlark Island).

Pomacentrus kumkum (Montrouzier) Thiollière: Fauna Woodlark, p. 200, 1857 (name in synonymy).

Pomacentrus melanotus Schmeltz: Mus. Godeffroy, Cat. 5, p. 32, 1874 (South Sea).

Head 3 1/3; depth 2 1/8; D. XIII, 13, 1; A. II, 13, 1; tubes 16 in upper arch of lateral line, 7 pores in straight section; 3 scales above lateral line, 10 below; 26 predorsal scales; snout 2 3/4 in head; eye 3 3/4; maxillary 3 2/3; interorbital 2 4/5. Least depth of caudal peduncle 1 7/8 in head.

Head width 1 4/5 in its length. Snout conic, length 7/8 its width. Eye moderate, hind pupil edge midway in head length. Maxillary reaches opposite hind nostril. Teeth uniserial, compressed or with small even ones interpolated evenly so cutting-edge appears single even margin. Interorbital widely convex. Suborbital and hind preopercle edge well denticulated, lower edge of latter entire. Gill rakers 7 + 14, lanceolate, 1 1/4 in gill filaments or 2 1/8 in eye. Scales with 9 basal radiating striae, edge scalloped; apical denticles 159 to 177, basal elements in 2 or 3 series; circuli very fine. First dorsal spine 4 1/4 in head; last dorsal spine 1 2/3; sixth branched dorsal ray 1 1/10; second anal spine 1 4/5; sixth branched anal ray 1 1/4; caudal and pectoral each little longer than head; ventral 1, spine 1 7/8.

Dull brownish generally. Upper half of head and front part of back deep dusky-brown, this including all spinous dorsal. Iris slaty. Black opercular spot about size of pupil. Length 137 mm.

One in the Bishop Museum from Faté.

Ceylon, East Indies, Melanesia.

Pomacentrus lividus (Schneider).

Chaetodon lividus (Forster) Schneider: Systema ichth. Bloch, p. 235, 1801 (type loc., Pacific Ocean).—Lichtenstein: Descriptiones animalium, p. 227, 1844 (St. Christian, Waitaho, Marquesas).

Pomacentrus lividus Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 228, pl. 124, fig. F, 1881 (Boston Island, Samoa, Upolu, Vavau, Huaheine, Ponapé, Borabora, Saint Christian).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1397, 1906 (Upolu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 283, 1905 (1906) (Pago Pago; Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 295, 1911 (Kusaie, Carolines).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 14, 34, 1925 (Guam; Samoa).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 116, 1928 (Apra Bay on Guam, Apia, Kusaie, Samoa).

Eupomacentrus lividus Fowler: Acad. Nat. Sci. Philadelphia, p. 527, 1900 (Samoa).

Pomacentrus punctatus Quoy and Gaimard: Voyage "Uranie," Zool., p. 395, pl. 64, fig. 1, 1825 (type loc., Mauritius; Hawaiian islands).—Cuvier: Hist. nat. Poiss., vol. 5, p. 322, 1830 (Bolabola).—Kner: Reise "Novara," Fische, vol. 2, p. 242, 1865 (Tahiti).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 80, 1900 (1901) (Guam).

Pomacentrus obscurus Thiollière: Fauna Woodlark, p. 200, 1857 (type loc., Woodlark Island).

Pomacentrus kumkum (Montrouzier) Thiollière: Fauna Woodlark, p. 200, 1857 (name in synonymy).

Pomacentrus cyanospilus Schmeltz: Mus. Godeffroy, Cat. 4, p. 21, 1869 (Samoa, Fiji).

Eupomacentrus (*Brachypomacentrus*) *albofasciatus* (non Schlegel and Müller) Bleeker: Verh. Hollandsche Maats. Haarlem, Verh., 3rd ser., vol. 2, no. 6, p. 75, 1877 (New Guinea).

Pomacentrus vitianus Sauvage: Soc. Philom. Paris, Bull., 7th ser., vol. 3, p. 206, 1878 (type loc., Fiji).

Pomacentrus prosopotaenia Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 363, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 272, 1883 (Hood Bay, New Guinea).

Pomacentrus nigricans (non Lacépède) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 52, 1906 (Shortland Island).

Head 2 3/5 to 3 1/4; depth 1 7/8 to 2 1/8; D. XIII, 14, 1; A. II, 14, 1; tubes 18 in upper section of lateral line, 8 pores in lower section to caudal base; 4 scales above lateral line, 9 below, 20 predorsal; least depth of caudal peduncle 1 4/5 in head; head width 1 3/5. Eye 2 1/2 in head, 1 1/5 in snout, 1 to 1 1/5 in interorbital, greater than snout or interorbital in young. Lips moderate, entire. Teeth uniserial, strong, close-set incisors, ends truncate. Hind preopercle and infraorbital edges denticulated strongly; hind preorbital edge with 3 strong denticles; lower edges entire. Gill rakers 7+13, lanceolate, 5/6 of gill filaments, which 1 3/5 in eye.

Scales with 6 to 8 basal radiating striae; apical denticles 164, basal elements in 1 or 2 series. Preorbital scaleless. First dorsal spine 4 1/4 in head, last spine 1 3/5; eighth dorsal ray 1 1/4; second anal spine 2 1/3; eighth anal ray 1 1/4; caudal ?; pectoral 1 to 1 1/3; ventral 1 or little more than head. Dull olivaceous. No axillary blotch. Black saddle on front of upper caudal peduncle edge, also extends on bases of few last dorsal rays. Iris slate.

In the Bishop Museum 1 from Shortland Island 100 mm. long. Also 1 from Guam in 1923. In the Agassiz Museum 1 from Kusaie, 10 Apia, and 1 Society Islands through Andrew Garrett. Also 7 from the Marshall Islands, April 5, 1876, and 1 from Strong Island, Caroline Islands, through Rev. B. G. Snow. Length 36 to 90 mm. The National Museum has 4 without locality, likely from Fiji or Samoa, obtained by the Wilkes Expedition. Others are 1 from Kusaie and 7 from Apia through the Bureau of Fisheries. The Academy has 1 from Samoa through H. C. Caldwell and 10 from Apia.

Mauritius, East Africa, Red Sea, East Indies, Melanesia, Micronesia, Polynesia.

Pomacentrus nigricans (Lacépède).

Holocentrus nigricans Lacépède: Hist. nat. Poiss., vol. 4, pp. 332, 367, 1803 (no type locality; on Commerson).

Pomacentrus nigricans Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 52, 1906 (Faté; Marquesas; Shortland Island; Raiatea; Makatea).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 281, 1905 (1906) (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 295, 1911 (Makemo, Paumotus; Papeete, Tahiti; Kusiae, Carolines).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 120, 1922 (Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 22, p. 34, 1925 (Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 20, 1925 (Wake Island, Laysan).—Fowler: op. cit., Bull. 38, p. 22, 1927 (Fanning, Howland and Baker islands).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 118, 1928 (Apra Bay on Guam, Samoa, Makemo, Oahu, Pago Pago).

Pomacentrus scolopseus Quoy and Gaimard: Voyage "Uranie," Zool. (January 29-May 26), p. 398, 1925 (type loc., Mauritius).

Pomacentrus scolopsis Günther: Cat. fishes Brit. Mus., vol. 4, p. 28, 1862 (Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 21, 1869 (Samoa; Viti Islands).—Günther: Cruise of "Curaçoa" (Brenchley), p. 410, 1873 (Solomons).—Günther: Rept. voyage "Challenger," vol. 1, p. 36, 1880 (Levuka, Fiji).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 227, pl. 125, figs. A-B, 1881 (Fiji; Solomon Islands; Samoa; Tonga; Society Islands; Friendly Islands; Pelew Islands; Ponapé).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma Island).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1397, 1906 (Upolu).

Pomacentrus taeniops Cuvier: Hist. nat. Poiss., vol. 5, p. 317, 1830 (type loc., Mauritius; Guam; Borabora).

Pomacentrus littoralis (non Cuvier) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 81, 1900 (1901) (Guam).

Pomacentrus lividus (non Bleeker) Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 131,

1902 (1903) (Marcus Island).—Seale: op. cit., vol. 4, no. 1, p. 52, 1906 (Raiatea; Nukuhiva).

Pomacentrus tripunctatus (non Cuvier) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 52, 1906 (Faté).

In the Bishop Museum 4 from Agaña on Guam, 1 Marcus Island, 12 Raiatea, 8 Nukuhiva, 1 Makatea, 5 Faté, 1 Shortland. Largest 137 mm. long. All show 12 dorsal spines and the suborbital scaly. The suborbital scales are more developed in the older and larger specimens. This is also true of the denticles along the suborbital and preopercle edges, as in the very young they may often be really only rudimentary denticulations. Also 23 from Wake Island and 2 from Laysan. The National Museum has a series from Samoa and 5 from Makemo. In the Agassiz Museum 24 Society Islands from Andrew Garrett, 2 Kusaie and 20 Pago Pago. The Academy has 23 from Pago Pago.

East Indies, China, Riu Kiu, Micronesia, Polynesia.

Pomancentrus aureus Fowler (fig. 54).

Pomacentrus aureus Fowler: B. P. Bishop Mus., Bull. 38, p. 22, fig. 3, 1927 (type loc., Howland Island).

The species *Pomacentrus aureus* differs from *Pomacentrus nigricans* in its pale or golden coloration. Known only from the two typical specimens in Bernice P. Bishop Museum; the larger 60 mm.

Head 2 4/5; depth 2; D. XII, 15, 1 or 16, 1; A. II, 12, 1 or 13, 1; tubes 19 in upper arch of lateral line, 8 pores in lower section to caudal base; 3 scales above lateral line, 9 below, 22 predorsal; snout 3 2/5 in head; eye 2 7/8; maxillary 3 7/8; interorbital 3 1/4. Least depth of caudal peduncle 1 7/8 in head; head width 1 3/4. Scales with 9 or 10 basal radiating striae; apical denticles 83 or 84, basal elements in 1 to 3 series; circuli fine. First dorsal spine 3 in head, last spine 1 7/8; second dorsal ray 1 2/5; second anal spine 1 3/5; sixth dorsal ray 1 1/4; caudal 1; pectoral 1 1/6; ventral 1. Uniform brown. Dusky blotch on last 6 dorsal rays and at front of caudal peduncle above.

In the Bishop Museum 2 from Agaña, Guam, 42 to 47 mm. long. The National Museum has 1 without locality, likely from Fiji or Samoa?, obtained by the Wilkes Expedition. Also a series of specimens from Samoa through the Bureau of Fisheries. In the Agassiz Museum 30 from Pago Pago. In the Academy 42 from Pago Pago.

Andamans, East Indies, Micronesia, Polynesia.

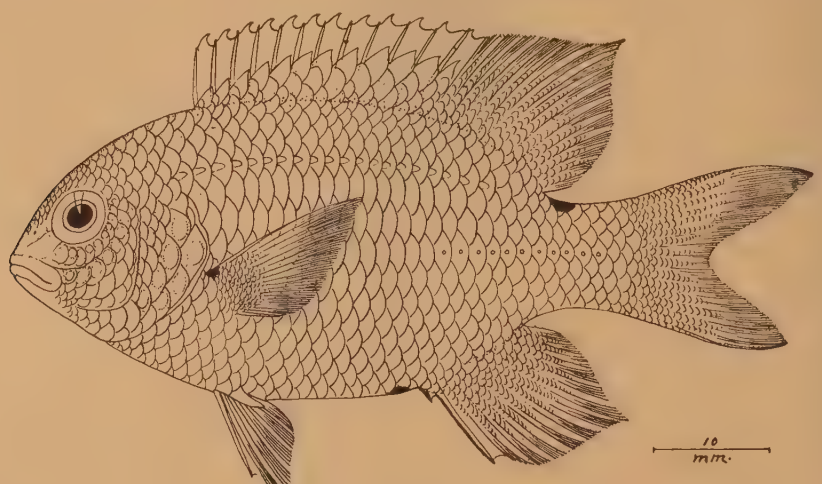

FIGURE 54.—Drawing of *Pomacentrus aureus*.

Pomacentrus albofasciatus Schlegel and Müller.

Pomacentrus albifasciatus Schlegel and Müller: Nat. Ges. Zool., Verhand., vol. 2, p. 21, 1839-44 (type loc., northeast coast of Celebes).—Fowler: B. P. Bishop Mus., Bull. 38, p. 22, 1927 (Christmas Island).

Pomacentrus albofasciatus Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 21, 1869 (Viti Islands).—Schmeltz: op. cit., vol. 6, p. 16, 1877 (Samoa).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 282, 1905 (1906) (Apia; Pago Pago).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 120, 1922 (Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 22, p. 34, 1925 (Samoa).—Fowler: B. P. Bishop Mus., Bull. 38, p. 22, 1927 (Christmas Island).

Pomacentrus punctatus (non Quoy and Gaimard) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 80, 1900 (1901) (Agaña, Guam).

Pomacentrus eclipticus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 282, fig. 50, 1905 (1906) (type loc., Apia).

Pomacentrus amboinensis Bleeker.

Pomacentrus amboinensis Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 334, 1868 (type loc., Amboina).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 363, 1882 (New Guinea).

Differs from *Pomacentrus tripunctatus* in a slightly larger black spot at the pectoral origin, this always present. Large white blotches on side of head and white dots only on upper part of head and tail. Two white longitudinal lines on front of anal. Reaches 100 mm.

East Indies.

Pomacentrus fasciatus Cuvier.

Pomacentrus fasciatus Cuvier: Hist. nat. Poiss., vol. 5, p. 320, pl. 134, 1830 (type loc., coast of Java).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 127, 1913 (Saonek, Waigiu).

Depth 2 3/4 in total; D. XII or XIII, 13; A. II, 12 or 13; scales 27, 3 above, 9 below. Preorbital denticulate. Caudal slightly emarginate. Brown, lighter below, with 4 yellow cross bands. Two parallel series of black spots from opercle along side of trunk. (Günther).

East Indies.

Pomacentrus bifasciatus Bleeker.

Pomacentrus bifasciatus Bleeker: Nat. Tijds. Ned. Ind., vol. 6, p. 330, 1854 (type loc., Larantuka, Flores).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 226, 1881 (Boston Island).

Brownish-yellow above, yellow below. Dark brown predorsal blotch and another at front of soft dorsal. Length 62 mm. (Bleeker)

Andamans, East Indies, Boston Island.

Pomacentrus inornatus De Vis.

Pomacentrus niomatus DeVis: Linn. Soc. New South Wales, Proc., vol. 8, p. 451, 1883 (type loc., probably South Sea Islands) (err. typog.).

Pomacentrus inornatus Jordan and Seale: (U.S.) Bur. Fish., Bull., vol. 25, p. 281, 1905 (1906) (Apia).—Regan: Zool. Soc. London, Proc., p. 370, pl. 58, fig. 1, 1913 (Easter Island).—Fuentes: Mus. Nac. Chile, Bolet., vol. 7, no. 1, p. 302, pl. 7, fig. 1, 1914 (Easter Island).—Fowler: B. P. Bishop Mus., Bull. 38, p. 22, 1927 (Laysan Island).

Pomacentrus jenkinsi Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 189, 1902 (1903) (type loc., Honolulu; Hilo; Kailua).—Snyder: op. cit., vol. 22, p. 527, 1902 (1904) (Honolulu; Waialua Bay; Napili Bay; Hanalei Bay; Puako Bay; Laysan Island; between Maui and Molokai).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 270, 1903 (1905) (Honolulu; Hilo; Kailua).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 132, 1912 (La Perouse Bay and Cook Bay, Easter Island; Hawaii).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 68, Dec. 1922 (Hawaii).—Fowler: H. P. Bishop Mus., Bull. 22, p. 28, 1925 (Honolulu).

Pomacentrus nigricans (non Lacépède) Quoy and Gaimard: Voyage "Uranie," Zool., p. 399, 1825 (Hawaiian islands).—Cuvier: Hist. nat. Poiss., vol. 5, p. 319, 1830 (Hawaiian islands).—Schlegel and Müller: Nat. Ges. Zool., Verhand., vol. 2, p. 20, 1839-44 (Hawaii).—Günther: Cat. fishes Brit. Mus., vol. 4, p. 34, 1862 (copied).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).

Eupomacentrus nigricans Fowler: Acad. Nat. Sci. Philadelphia, p. 503, 1900 (Honolulu).

Eupomacentrus marginatus (non Rüppell) Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 391, fig. 5, 1899 (1901) (Honolulu).

Pomacentrus emarginatus (non Cuvier) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 15, 20, 21, 1902 (Hilo; Honolulu).

Head 3 2/5; depth 2; D. XIII, 15, 1; A. II, 13, 1; tubes 21 in upper arch of lateral line and 8 pores in lower section to caudal base, with 2 more on latter; 3 scales above lateral line, 12 below, 26 predorsal; snout 3 1/8 in head; eye 3 1/4; maxillary 3 1/4; interorbital 2 4/5. Least depth of caudal peduncle 1 7/8 in head; head width 1 3/5. First dorsal spine 3 in head, last spine 1 7/8; second anal spine 1 9/10; sixth dorsal ray 1 1/6; sixth anal ray 1 1/3; pectoral 1; ventral 1 1/8; caudal little greater than head.

The Bishop Museum has 11 from Honolulu and 1 from Hilo, largest 126 mm. I found 6 in the Honolulu markets in November, 1922. In the National Museum 1 obtained by the Wilkes Expedition without locality, likely from Maui ?. Other materials, the types of *Pomacentrus jenkinsi*, 58 Hawaiian, 2 Puako Bay, 5 Hilo, 12 Honolulu, 2 from Apia, and 38 from Easter Island, February 20, 1904. The Agassiz Museum has 18 from Perouse Bay on Easter Island and 10 Hawaiian specimens. The Academy has 3 from Honolulu.

I cannot find any specific differences between Hawaiian and Easter Island materials. Those suggested by Regan are easily covered by my materials. At present this species seems to be known only from Oceania.

Pomacentrus semifasciatus Günther.

Pomacentrus semifasciatus Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 226, pl. 125, fig. F, 1881 (type loc., Boston Island, Marshalls).

Head 2 3/4; depth 2 3/4; D. XIII, 13; A. II, 13; scales 29 in median lateral series, 3 above, 9 below; snout 4 in head; eye 3 1/8; maxillary 3 2/5. Preorbital and infraorbitals naked, edges entire; preopercle edge serrate; snout naked. Soft dorsal and anal rounded; caudal emarginate. Reddish, with pearly cross-band on back below fifth and sixth dorsal spines. Base of soft dorsal and blotch behind last dorsal rays white. Ventral and anal black, other fins clear. Length 50 mm. (Günther)

Only known from the type.

Pomacentrus pomacentroides (Kendall and Goldsborough).

Dascyllus pomacentroides Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 298, pl. 5, fig. 1, 1911 (type loc., Taritari, Gilbert Islands).

Head 3 1/5; depth 2; D. XII, 11, 1; A. II, 11, 1; 17 scales, 16 in upper section of lateral line of which first 2 non-tubular; scales 26 in median lateral series; 3 scales above lateral line, 8 below; snout 4 in head from snout tip; eye 2 7/8; maxillary 3, reaches little beyond front of eye, not to pupil. Preopercle serrate. Dorsal spines largely subequal from fourth. Caudal forked. Brown, with some slightly darker longitudinal streaks. Anal dusky anteriorly. Upper and lower caudal edges little darker than median rays. Length 63 mm. (Kendall and Goldsborough)

Type in the National Museum. Though described with the "preorbital serrate" it is not clearly figured so and the infraorbital rim appears adnate. The teeth in the jaws are in several series, rather large, conic, and the outer row in both enlarged. Though originally placed in *Dascyllus* it is hardly like any of the species of that genus, besides of longitudinal contour.

Abudefduf saxatilis (Linné).

Chaetodon saxatilis Linné: Systema nat., 10th ed., p. 276, 1758 (type loc., India).

Abudefduf saxatilis Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 54, 1906 (Tubuai; Shortland Island).—Jordan and Seale: (U.S.) Bur. Fish., Bull., vol. 25, p. 285, 1905 (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 296, 1911 (Fakarava and Makemo, Paumotus).—Weber: Siboga Exped., vol. 65, p. 345, 1913 (Atjatuning, west coast New

Guinea).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 124, 1928 (Apia, Mangareva, Fakarava).

Abudefduf saxatilis saxatilis Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 127, 1913 (Sorong, New Guinea; Saonek, Waigiu).

Glyphisodon vaigiensis Quoy and Gaimard: Voyage "Uranie," Zool., p. 391, 1825 (type loc., Iles des Papous).

Glyphisodon waigiensis Cuvier: Hist. nat. Poiss., vol. 5, p. 341, 1830 (Waigiu; Rauwak).—Thiollière: Fauna Woodlark, p. 199, 1857 (Woodlark Island).

Glyphisodon rahti Cuvier: Hist. nat. Poiss., vol. 5, p. 341, 1830 (type loc., New Guinea; Red Sea; Java; Celebes).—Schlegel and Müller: Nat. Ges. Zool., Verhand., vol. 2, p. 22, 1839-44 (west New Guinea and Waigiu).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (1860) (Doreh, New Guinea).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).

Glyphisodon biniar (Montrouzier) Thiollière: Fauna Woodlark, p. 199, 1857 (name in synonymy).

Abudefduf septemfasciatus (non Cuvier) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 82, 1901 (Guam).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 53, 1906 (Makatea; Rarotonga; Faté).

Abudefduf coelestinus (non Cuvier) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 52, 1906 (Faté; Shortland Island; Nukuhiva; Tahiti).

The Bishop Museum contains 10 Nukuhiva, 2 Makatea, 3 Shortland Island, 1 Rarotonga, 3 Faté, 1 Agaña on Guam and 1 Tahiti. Length 177 mm. In the National Museum 7 Fakarava and 1 Apia. The Agassiz Museum has 5 Makemo and those obtained by Andrew Garrett, as 1 Kingsmill Islands and 5 Society Islands.

At all ages this species is distinguished from the closely related *Abudefduf sexfasciatus* by the absence of a dark or blackish longitudinal band in each lobe of caudal.

Red Sea, Zanzibar, Mozambique, Madagascar, Mauritius, Reunion, Seychelles, India, Ceylon, Andamans, East Indies, China, Queensland, Melanesia, Micronesia, Polynesia.

Abudefduf abdominalis (Quoy and Gaimard).

Glyphisodon abdominalis Quoy and Gaimard: Voyage "Uranie," Zool., p. 390, 1825 (type loc., Hawaiian islands).—Cuvier: Hist. nat. Poiss., vol. 5, p. 342, 1830 (Hawaiian islands).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 453, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 527, 1902 (1904) (Honolulu; Waialua Bay; Napili Bay; Hanalei Bay; Puako Bay; Laysan Island; between Maui and Molokai).

Abudefduf abdominalis Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 272, fig. 116, 1903 (1905) (Honolulu; Hilo; Kailua).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 68, Dec. 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 20, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 21, 1925 (Laysan and Lisiansky islands).

Abudeefduf abdominalis Steindachner: Akad. Wiss Wien, Sitz., vol. 115, pt. 1, p. 1395, 1906 (Upolu).

Glyphidodon coelestinus (non Valenciennes) Günther: Cat. fishes Brit. Mus., vol. 4, p. 38, 1862 (Hawaiian islands).

Glyphidodon saxatilis (non Linné) Streets: U. S. Nat. Mus., Bull., no. 7, p. 66, 1877 (Honolulu).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 229, pl. 126, 1881 (Hawaiian islands; Tahiti).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 502, 1901 (Honolulu; Laysan).

Abudefduf saxatilis Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 15, 16, 1902 (Hilo).

Abudefduf sexfasciatus (non Lacépède) Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 504, 1900 (Hawaiian islands).

Head 2 3/5 to 2 2/3; depth 1 3/4 to 2 1/10; D. XIII, 14, I, rarely 13, I; A. II, 14, I, rarely 13, I; snout 2 2/5 to 4 1/5 in head; eye 2 1/3 to 4 1/4; maxillary 3 to 3 4/5; interorbital 2 2/3 to 3 1/5; tubes 20 to 22 in upper section of lateral line, pores 8 or 9 in lower section. Head width 1 2/3 in its length. First dorsal spine 4 in head; thirteenth 2; second anal spine 2 1/10; fifth dorsal ray 1 1/5, sixth 1 1/3; least depth of caudal peduncle 1 5/6; caudal greater than head; pectoral 1; ventral 1 1/6.

The Bishop Museum has 11 from Honolulu, 1 from Moilii on Oahu, 1 Hilo, 1 Laie on Oahu by C. Montague Cooke, Jr., on November 5, 1922, and 12 at Waikiki in 1922 by C. H. Edmondson. I found 460 specimens in the Honolulu markets during November and December, 1922, and January, 1923. Largest 235 mm. Also 11 from Laysan in 1923. In the Academy 9 Hawaiian specimens. The National Museum has 25 from Honolulu, of which 1 from W. H. Jones and 2 from T. H. Streets. The Wilkes Expedition obtained 5 at Oahu and 2 at Maui?. The Agassiz Museum has 9 Hawaiian specimens, of which 2 from Andrew Garrett and 1 from W. H. Jones, in 1874, obtained at Honolulu.

Abudefduf bengalensis (Bloch).

Chaetodon bengalensis Bloch: Nat. ausländischen Fische, pt. 3, p. 110, pl. 213, fig. 2, 1787 (type loc., Bengal).

Glyphisodon bengalensis Cuvier: Hist. nat. Poiss., vol. 5, p. 342, 1830 (Vanicolo).

Differs from *Abudefduf saxatilis* in the presence of 7 dark vertical bands (5 in *Abudefduf saxatilis*) and these much narrower than the pale interspaces.

Red Sea and East Africa to the East Indies and China.

Abudefduf sexfasciatus (Lacépède).

Labrus sexfasciatus (Commerson) Lacépède: Hist. nat. Poiss., vol. 3, pp. 430, 477, pl. 19, fig. 2, 1802 (type loc., "The Great Ocean" [Indo-Pacific]).

Abudefduf sexfasciatus Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 297, 1911 (Papeete, Tahiti; Fakarava and Makemo, Paumotus).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 129, 1928 (Apia, Papeete, Fakarava, Pago Pago).

Glyphisodon coelestinus (Solander) Cuvier: Hist. nat. Poiss., vol. 5, p. 347, pl. 34, 1830 (type loc., Sea of the Indies; Mauritius; Malabar; Ulietea, Society Islands).—Schlegel and Müller: Nat. Ges. Zool., Verhand., vol. 2, p. 22, 1839-44 (Ulietea; Friendly Islands).

Chaetodon coelestinus (Parkinson) Cuvier: Hist. nat. Poiss., vol. 5, p. 347, 1830 (name in text).

Glyphidodon coelestinus Schmeltz: Mus. Godeffroy, Cat. 4, p. 21, 1869 (Viti Islands).—Günther: Cruise of "Curaçoa" (Brenchley), p. 410, 1873 (Solomons).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 32, 1874 (Samoa).

Gliphidodon coelestinus Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 364, 1882 (New Guinea).

Abudefduf coelestinus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 52 (Faté; Shortland Island; Raiatea; Nukuhiva; Tahiti).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 285, pl. 41,

fig. 1, 1905 (1906) (Apia; Pago Pago).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 355, 1906 (Tahiti).—Fowler and Silvester: Carnegie Inst., Marine Biol. Pap., p. 120, 1922 (Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 22, p. 34, 1925 (Samoa).

Abudefduf saxatilis coelestinus Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 128, 1913 (Saonek, Waigiu).

Glyphidodon coelestinus var. *waigiensis* Schmeltz: Mus. Godeffroy, Cat. 5, p. 32, 1874 (Samoa).

Greatly like *Abudefduf saxatilis* and its larger dark transversely banded allies, but readily distinguished by each lobe of the caudal with a large dark median band.

The Bishop Museum has 4 from Faté, 2 Shortland Island and 2 Raiatea. Largest 138 mm. In the National Museum 2 from New Guinea, 10 Fakarava, 1 Papeete and a series of adults from the Paumotus. Also 11 from Apia and 1 from Society Islands through Andrew Garrett. Largest 145 mm. The Agassiz Museum has 1 from Makemo and 5 from Papeete.

Mauritius, India, East Indies, China, Melanesia, Polynesia.

Abudefduf sordidus (Forskål).

Chaetodon sordidus Forskål: Descriptiones animalium, pp. 13, 62, 1775 (type loc., Djedda, Red Sea).

Glyphidodon sordidus Streets: U. S. Nat. Mus., Bull., no. 7, p. 86, 1877 (Palmyra Island).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 231, 1881 (Tahiti; Raiatea; Samoa; Bonin Islands).—Waite: Australian Mus., Mem., no. 3, p. 192, 1897 (Funafuti, Ellice Islands).—Regan: Zool. Soc. London, Proc., pt. 1, p. 404, 1909 (Christmas Island, Indian Ocean).

Glyphisodon sordidus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 458, 1902 (1903) (Honolulu; Lahaina).—Snyder: op. cit., vol. 22, p. 527, 1902 (1904) (Honolulu; Puako Bay; Napili Bay; Necker Island; Laysan Island).

Abudefduf sordidus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 504, 1900 (Hawaiian islands).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 274, 1903 (1905) (Kailua, Hilo, Waianae, Moanalua, Honolulu, Lahaina).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 53, 1906 (Faté; Makatea).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 284, 1905 (1906) (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 295, 1911 (Makatea, Fakarava, Anaa and Rangiroa, Paumotus).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 133, 1912 (Mangareva and Rikitea, Paumotus).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 68, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 14, 29, 1925 (Guam; Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 21, 1925 (Nihoa, Necker, Laysan, Lisiansky, Johnston, and Wake islands).—Fowler: op. cit., Bull. 38, p. 23, 1927 (Palmyra, Fanning, Jarvis, Tongareva, Howland and Baker islands).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 132, 1928 (Apia, Honolulu, Laysan, Mangareva, Rikatea, Fakarava, Makatea, Hawaii, Oahu, Maui).

Abudeefduf sordidus Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1395, 1906 (Savaii).

Abudefduf saxatilis (non Linné) Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 131, 1903 (Marcus Island).

Pomacentrus lividus (non Schneider) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 52, 1906 (Nukuhiva).

Abudefduf zonatus (non Cuvier) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 55, 1906 (Nukuhiva).

The largest species of the genus, with deep body. Dorsal rays 15 or 16, anal rays 14 to 16. Like *Abudefduf septemfasciatus* snout scaleless. Six broad dark vertical bands obscure with age, though usually black ocellus behind soft dorsal persists.

The National Museum has 1 from Maui and another without definite locality, taken at Fiji, Samoa or Maui, by the Wilkes Expedition. Other materials are 1 from Apia, 1 Fakarava, 5 Mangareva, 5 Jaluit, 1 Maketa, 13 Honolulu, 4 Laysan, 1 Tahiti from William Stimpson, and 2 Fanning Islands from T. H. Streets. The Bishop Museum contains 8 from Honolulu, 2 Mokuauia Island off Oahu on November 4, 1922, by C. Montague Cooke, Jr., and Henry W. Fowler, 2 Laysan Island in April-May, 1903, by W. A. Bryan, 2 Faté, 2 Makatea, 1 Marcus Island, 5 Nukuhiva, 1 from Guam in 1923, 1 Nihoa, 1 Necker, 9 Laysan, 1 Lisiansky, 8 Johnston Island, 2 Wake Island. We found the young in small numbers in the rock pools in the reef at Mokuauia Island.

When fresh from the water silvery gray, white below, with 6 dark vertical bands scarcely evident but appearing later when specimen is placed in alcohol. Small black dot at pectoral origin. Large round ocellate black blotch size of pupil, bordered white, at front of caudal peduncle very distinct. Ventrals and vertical fins all more or less tinted with dusky. Pectoral pale or transparent. Iris silvery-white.

The Agassiz Museum has 4 Kingsmill Island specimens, 7 Society Islands, and 18 Hawaiian collected by Andrew Garrett, 2 Honolulu from W. H. Jones in 1874, 1 Rangiroa, and 1 Anaa in Tuamotus and 1 Tango on Sancti Espiritu Island in New Hebrides. The Academy contains 8 Hawaiian specimens and 1 from Maui.

Red Sea, Zanzibar, Mauritius, Reunion, Seychelles, India, Nicobars, Andamans, East Indies, China, Queensland, Melanesia, Polynesia, Hawaii.

Abudefduf septemfasciatus (Cuvier).

Glyphidodon septemfasciatus Cuvier: Hist. nat. Poiss., vol. 5, p. 346, 1830 (type loc., Mauritius).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 32, 1874 (Savaii).—Streets: U. S. Nat. Mus., Bull., no. 7, p. 6, 1877 (Palmyra Island).—Macleay: Linn. Soc. New South Wales, Proc., vol. 4, p. 64, 1897 (Solomons).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 230, 1881 (South Sea).—Waite: Australian Mus., Mem., no. 3, p. 192, 1897 (Funafuti, Ellice Islands).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 229, 1898 (Guam).

Abudefduf septemfasciatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 53, 1906 (Shortland Island).—Fowler: B. P. Bishop Mus., Bull. 22, p. 14, 1925 (Guam).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 21, 1925 (Wake Island).—Fowler: op. cit., Bull. 38, p. 24, 1927 (Fanning Island).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 135, 1928 (Fanning, Apia, Makemo, Taritari, Makatea).

Abudeefduf septemfasciatus Steindachner: Akad. Wiss. Wien., Sitz., vol. 115, pt. 1, p. 1395, 1906 (Upolu).

Abudefduf sexfasciatus (non Lacépède) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 82, 1900 (Guam).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 285, 1905 (1906) (Apia).—Kendall and

Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 295, 1911 (Makatea; Paumotus; Tahaa, Society Islands; Taritari, Gilbert Islands).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 134, 1912 (Rikitea, Mangareva, Gambier Islands).

Abudefduf coelestinus (non Cuvier) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 52, 1906 (Raiatea; Shortland Island).

Abudefduf multifasciatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 53, 1906 (Raiatea).

In this species the seventh dark vertical band is at the caudal base, and not on the middle of the side of the caudal peduncle as in *Abudefduf saxatilis*.

The National Museum has 1 from Tongatabu and 1 without locality, likely from Fiji or Samoa?, obtained by the Wilkes Expedition. Other materials are 4 from Apia, 5 adults from the Fanning Islands through T. H. Streets, 9 Makemo, 1 Taritari, and 32 Maketa. In the Bishop Museum 2 from Raiatea, 4 from Shortland Island, 2 from Guam in 1923, 2 Wake Island. The Agassiz Museum has 2 from Apiang through Andrew Garrett and 10 from Ebon Island, Marshall Islands, through Rev. B. G. Snow in April, 1877.

Red Sea, Mauritius, Seychelles, India, Nicobars, East Indies, China, Queensland, Melanesia, Micronesia, Polynesia.

Abudefduf notatus (Day).

Glyphidodon notatus Day: Zool. Soc. London, Proc., p. 521, 1869 (type loc., Andaman Islands).

Abudefduf notatus Fowler: B. P. Bishop Mus., Bull. 38, p. 24, 1927 (Howland Island).

Olive brown, with five narrow vertical whitish bands, often only first which extends down from spinous dorsal origin distinct. Blackish blotch at pectoral origin and on hind opercular edge.

In Oceania known only from two specimens in the B. P. Bishop Museum obtained at Howland Island, larger 32 mm. According to Day it reaches 88 mm.

Abudefduf curacao (Bloch) (fig. 55).

Chaetodon curacao Bloch: Naturg. ausländischen Fische, pt. 3, p. (79) 106, pl. 212, fig. 1, 1787 (type loc., "Southern America, Curaco Island").

Glyphysodon curassao Kittlitz: Denkw. Reise Mikronesien, vol. 2, p. 161, 1858 (Ulea).

Abudefduf curacao Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 53, 1906 (Shortland Island).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 297, 1911 (Jaluit, Marshalls).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 138, 1928 (Apia, Jaluit).

Glyphidodon trifasciatus Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 231, 1881 (Ponapé).

Gliphidodon trifasciatus Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 364, 1882 (New Guinea).

Gliphidodon nigrifrons Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 271, 1883 (type loc., southeast coast of New Guinea).

Glyphisodon nigrifrons McCulloch: Australian Mus., Records, vol. 11, p. 182, 1917 (type).

Chromis analis (non Cuvier) Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 292, 1905 (1906) (Apia, Samoa).—Fowler: B. P. Bishop Mus., Bull. 22, p. 34, 1925 (Samoa).

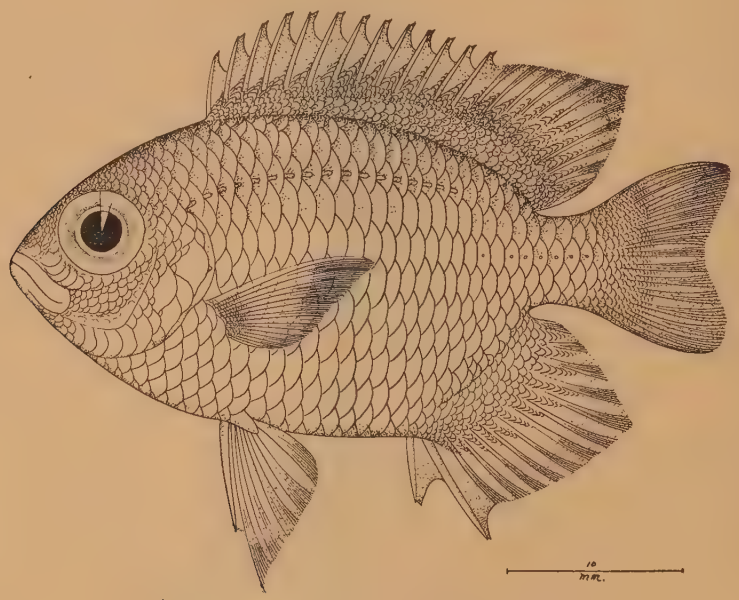

FIGURE 55.—Drawing of *Abudefduf curacao*.

Head 3 1/10 to 3 2/5; depth 1 2/3; D. XIII, 11, 1 or 12, 1; A. II, 11, 1 to 13, 1; tubes 15 or 16 in upper arch of lateral line (followed by 2 pores) and 7 to 9 pores in straight section to caudal base; 3 scales above lateral line, 9 or 10 below; 22 to 30 predorsal scales; snout 3 to 3 1/3 in head; eye 2 1/3 to 2 7/8; maxillary 2 7/8 to 3 1/10; interorbital 2 1/10 to 2 3/4.

Body deeply ovoid, compressed. Least depth of caudal peduncle 2 in head. Head width 1 1/2 to 1 3/4 in its length. Snout obtuse, convex, length half to 2/3 its width. Eye much larger than snout. Maxillary very oblique, reaches eye or only very slightly beyond. Teeth uniserial, compressed, ends slightly truncate. Interorbital slightly and evenly convex. Suborbital and preopercle edges entire. Gill rakers 7 to 9 + 18 to 22, lanceolate, 1 1/8 in gill filaments or 2 1/5 to 3 in eye. Scales with 6 to 9 basal radiating striae; 119 to 125 apical

denticles, basal elements in 1 to 3 series; circuli fine. First dorsal spine 3 1/8 in head; last 1 3/4; third dorsal ray 1+1/10; second anal spine 1 1/4; first anal ray 1 1/5; caudal 1; pectoral and ventral both little longer than head. Deep brown above, fins and below pale brown. Deep brown transverse bands indistinct. Dorsals and upper and lower caudal edges little deeper brown. Iris pale slaty.

The Bishop Museum contains 2 from Shortland Island, 90 mm. long. The Agassiz Museum has 3 from Jaluit in the Marshalls, 1 in the Kingsmill Islands and 5 from Apia, Samoa. Six in the National Museum from Apia as *Chromis analis*. Five in the Academy from Apia.

East Indies, Riu Kiu, Micronesia, Melanesia, Polynesia.

Abudefduf unimaculatus (Cuvier).

Glyphisodon unimaculatus Cuvier: Hist. nat. Poiss., vol. 5, p. 358, 1830 (type loc., Timor).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, pp. 3, 4, 1859 (Doreh, New Guinea).

Abudefduf unimaculatus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 145, 1928 (Samoa).

Differs from *Abudefduf curacao* in the absence of transverse dark bands. Suborbitals with row of scales. Small black spot at pectoral origin; front of soft dorsal and anal and upper and lower caudal edges dusky.

East Indian region, Melanesia.

Abudefduf dickii (Liénard).

Glyphisodon dickii Liénard: Soc. Hist. Nat. Maurice, Dix Rapp., p. 35, 1839 (type loc., Mauritius).

Glyphidodon dickii Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 232, pl. 125, fig. C, 1881 (Samoa; Ponapé).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma Island).

Abudefduf dickii Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 84, 1900 (Guam).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 285, 1905 (1906) (Apia).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 147, 1928 (Apia).

Abudeefduf dickii Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1396, 1906 (Samoa).

Glyphidodon unifasciatus Kner and Steindachner: Akad. Wiss. Wien, Sitz., vol. 54, pt. 1, p. 375, fig. 3, 1867 (type loc., Upolu, Samoa).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 21, 1869 (Samoa).

Head 3 1/10; depth 1 3/4; D. XII, 17, 1; A. II, 14, 1; tubes 21 in upper arch of lateral line and 7 pores in straight section to caudal base; 4 scales above lateral line, 12 below; 25 predorsal scales; snout 3 2/3 in head measured from upper jaw tip; eye 3 5/6; maxillary 3 3/4; interorbital 3.

Back well elevated, with contour deeply ovoid. Least depth of caudal peduncle 1 9/10 in head. Head width 1 3 /4 in its length. Snout conic, length 4/5 its width. Teeth uniserial, slightly compressed, ends rather attenuated, not truncate. Interorbital evenly convex. Infraorbital half of eye, its lower edge and preopercle edge entire. Gill rakers 2 + 10, short, weak, lanceolate, 3 1/2 in gill filaments, which 1 1/5 in eye. Scales with 8 to 10 basal radiating striae, edge scalloped; apical denticles 128, basal elements in 2 or 3 series; circuli fine. Scaly dorsal sheath extends well up on spines posteriorly and small scales also cover most of soft fin, with caudal and anal and basal third of pectoral scaly. First dorsal spine 2 7/8 in head; last 1 2/5; third dorsal ray 1 1/6; second anal spine 1 2/3; fifth anal ray 1 1/10; caudal little longer than head; pectoral 1; ventral 1.

Pale brown. Broad black band obliquely down to hind basal half of soft anal, about 4 scales in width. All scales on back anterior to dark band and on trunk likewise, with narrow darker edges. Ventral with dusky tint terminally. Pectoral and caudal pale yellowish.

When fresh largely olive-brown, base of each scale darker. Head, dorsals and anals with pale spots. Black transverse bar from soft dorsal to soft anal, behind this caudal peduncle white, then caudal salmon-color with narrow dusky edge. Pectoral yellow basally. Ventral dusky. Iris slaty.

Three in the National Museum from Apia. One in the Bishop Museum from Agaña, Guam, 106 mm. Also 1 from Palmyra Island, secured by Thurston and Thaanum, in 1922.

Mauritius, East Indies, Micronesia, Polynesia.

Abudefduf leucozonus (Bleeker).

Glyphisodon leucozonus Bleeker: Nat. Tijds. Ned. Ind., vol. 19, p. 338, 1859 (type loc., Karangbollong, Java).

Abudefduf lacrymatus (non Quoy and Gaimard) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 83, 1900 (Guam).

Pomacentrus pavo (non Bloch) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, pt. 1, p. 52, 1906 (Raiatea; part).

Pomacentrus nigricans (non Lacépède) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, pt. 1, p. 52, 1906 (Makatea).

Abudefduf zonatus (non Cuvier) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, pt. 1, p. 55, 1906 (Nukuhiva).

In the Bishop Museum I find the specimens noted below, as 2 from Agaña on Guam, 1 Laysan Island? from W. A. Bryan, 1 Faté, 1 Raiatea, 5 Makatea and 1 Nukuhiva. The Agaña specimens, in poor preservation, both have D. XII, 14. They differ from the others chiefly in the presence of a large black ocellus at the bases of the last dorsal rays, narrowly bordered with white. Traces of blue spots, which large on head and fore part of trunk, evident. Black blotch at pectoral base. They would suggest *Glyphidodon uniocellatus* except Günther describes that species with D. XIII, 13, and the young with the spinous dorsal uniform transparent light violet. Length 30 mm. The Laysan specimen is 32 mm. D. XII, 15. Large black ocellus on last dorsal spines and on back above lateral line, also black blotch on caudal peduncle close behind soft dorsal rays. The Faté specimen is 40 mm. long. D. XII, 15. No distinct black spots. One from Raiatea 41 mm. D. XII, 16. No distinct black spots except one on third membrane of spinous dorsal marginally. The Makatea specimens 34 to 60 mm. D. XII, 15, once 14. The 2 smallest show the black pectoral blotch and black blotch close behind last dorsal rays besides large black ocellus on last dorsal spines. My Nukuhiva specimen 55 mm. D. XII, 15. The black pectoral axillary spot and the one on front of caudal peduncle above are very distinct in my examples, though there is no trace of the transverse pale band be-

low sixth and seventh dorsal spines, which is shown on Bleeker's plate (Atlas ichth., vol. 9, pl. [8] 407, fig. 2, 1877-78). Bleeker shows the very large black ocellus below the last dorsal rays, but above the lateral line. This is present in all my specimens, though now a little obscure, due to the preservation. It is clearly at the bases of the last dorsal spines and on the back, in all cases.

Günther says "the width of the preorbital, above the angle of the mouth, is two-thirds of that of the orbit." The species is an interesting addition to the ichthyfauna of Oceania.

Red Sea, East Indies, Micronesia, Melanesia, Polynesia, Hawaii.

Abudefduf lacrymatus (Quoy and Gaimard).

Glyphisodon lacrymatus Quoy and Gaimard: Voyage "Uranie," Zool., p. 388, pl. 62, fig. 7, 1825 (type loc., (Guam).—Cuvier: Hist. nat. Poiss., vol. 5, p. 358, 1830 (Guam).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).

Glyphidodon lacrymatus Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 232, pl. 125, fig. D, 1881 (Howland Island, Guam, Yap).

Abudeefduf lacrymatus Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1396, 1906 (Upolu).

Abudefduf lacrymatus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 285, 1905 (1906) (Apia).—Fowler and Bean: U. S. Nat. Mus., Proc., vol. 71, p. 15, 1927 (Tahiti).

Glyphisodon nivosus Hombron and Jacquinot: Voyage "Astrolabe," Zool., vol. 3, p. 50, pl. 5, fig. 5, 1853 (no type locality).

Head 2 4/5; depth 2; D. XII, 16; A. II, 13; tubes 18 in upper arch of lateral line, followed by 3 pores and 9 pores in straight section to caudal base; 4 scales above lateral line, 11 below, 24 predorsal scales; snout 3 1/2 in head; eye 2 4/5; maxillary 4; inteororbital 4.

Body deeply ovoid. Least depth of caudal peduncle 2 1/3. Head width 1 3/4 in its length. Snout conic, length 3/5 its width. Teeth uniserial, compressed, more or less incisor-like. Maxillary reaches opposite eye. Preorbital 2 in eye, infraorbital much narrower and scaleless. Preopercle with 4 low denticles on lower hind edge, otherwise entire. Gill rakers 5 + 13, lanceolate, 2 in gill filaments, which 1 3/4 in eye. Scales with 10 basal radiating striae, edge scalloped; apical denticles 72 to 74, basal elements in 1 or 2 series; circuli very fine. First dorsal spine 3 in head; last 1 9/10; sixth dorsal ray 1 1/3; second anal spine 2 1/10; sixth anal ray 1 1/3; caudal 1; pectoral 1 1/4; ventral 1 1/10.

Dull brown, nearly uniform. Small inconspicuous dusky spot on caudal peduncle close behind last dorsal ray. Spinous dorsal and soft anal with slightly dusky tinge terminally. Iris pale slaty. Length 45 mm.

One in the Bishop Museum from Nukuhiva. In most every way, though greatly faded, this specimen agrees with Günther's figure, also Bleeker's (Atlas ichth., vol. 9, pl. [3] 403, fig. 6, 1877). One in the National Museum from Samoa.

Red Sea, East Indies, Melanesia, Micronesia, Polynesia.

Abudefduf bonang (Bleeker).

Glyphisodon bonang Bleeker: Nat. Tijds. Ned Ind., vol. 3, p. 522, 1852 (type loc., Padang, Sumatra).

Glyphidodon bonang Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Samoa).—Streets: U. S. Nat. Mus., Bull., no. 7, p. 99, 1877 (Samoa).

Black ocellus at last dorsal spines. Each scale with light blue spot.

Three in the National Museum from Samoa, from Steinberger.

East Indies to Japan and Polynesia.

Abudefduf xanthurus (Bleeker).

Glyphisodon xanthurus Bleeker: Nat. Tijds. Ned. Ind., vol. 5, p. 345, 1853 (type loc., Amboina).

Paraglyphidodon xanthurus Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

Dusky band below eye and another along and behind preopercle edge. Ventrals and front of anal dusky.

East Indian region, Melanesia.

Abudefduf behnii (Bleeker).

Glyphisodon behnii Bleeker: Bataviaasch Genoot. Verh. (Labr. Cten.), vol. 21, p. 25, 1846-47 (type loc., Java).

Abudefduf behnii Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 53, 1906 (Rarotonga).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 285, 1905 (1906) (Apia).

Abudefduf corneyi Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 613, fig. 5, 1908 (Suva, Fiji).

Head 3 1/4; depth 2; D. XII, 15, 1; A. II, 12, 1; tubes 20 in upper arch of lateral line and 6 pores in straight section to caudal base; 4 scales above lateral line, 11 below; 26 predorsal scales; snout 3 in head; eye 4; maxillary 3 1/4; interorbital 2 3/5. Least depth of caudal peduncle 1 9/10 in its length. Head width 1 2/3 its length. Snout conic, length 3/4 its width. Maxillary extends slightly beyond nostril, not quite to eye. Teeth uniserial, compressed incisors. Nostril at last third in snout. Preorbital, infraorbital and preopercle edges entire. Gill rakers 4+12, lanceolate, slightly less than half of gill filaments or 3 in eye. Scales with 10 or 11 basal radiating striae; apical denticles 145 to 162; circuli fine. Row of scales on suborbitals down nearly opposite hind maxillary end. First dorsal spine 3 3/4 in head; fifth 1 7/8; fifth dorsal ray 1 1/2; second anal spine 1 3/5; fourth anal ray 1 2/5; caudal 1; pectoral 1 1/10; ventral 1 1/10. Dusky-brown generally. Vertical fins and ventral all with more or less dusky. Black spot at pectoral origin. Length 125 mm.

One in the Bishop Museum from Rarotonga. In the National Museum 1 from Samoa, 98 mm. also the type of *Abudefduf corneyi,* which differs in no way from the Rarotonga specimen. My specimens differ in no way from Bleeker's two, except that he gives 13 dorsal spines.

East Indies, Polynesia.

Abudefduf melas (Cuvier).

Glyphisodon melas (Kuhl and Van Hasselt) Cuvier: Hist. nat. Poiss., vol. 5, p. 353, 1830 (type loc., Java).

Glyphidodon melas Günther: Cat. fishes Brit. Mus., vol. 4, p. 45, 1862 (Aneiteum).

Glyphidodon (Paraglyphidodon) melas Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 502, 1901 (Laysan).

Abudefduf melas Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 128, 1913 (Saonek, Waigiu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 22, 1925 (French Frigates Shoal and Honolulu).

Chromis melas Fowler: B. P. Bishop Mus., Bull. 22, p. 28, 1925 (Honolulu) [lapsus for *Abudefduf*].

Readily distinguished by its uniform blackish coloration.

One in the Bishop Museum 161 mm. from Honolulu. In the Honolulu markets I examined 10 specimens during November and December, 1922, and January, 1923. Also 3 from French Frigates Shoal.

Red Sea and Zanzibar to the East Indies, Riu Kiu, Melanesia, Hawaii.

Abudefduf biocellatus (Quoy and Gaimard).

Glyphisodon biocellatus Quoy and Gaimard: Voyage "Uranie," Zool., p. 389, Jan. 29-May 26, 1825 (type loc., Guam).—Cuvier: Hist. nat. Poiss., vol. 5, p. 361, 1830 (Guam; Strong Island; New Hebrides).—Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 188, 1830 (Oualan).

Glyphidodon biocellatus Peters: Akad. Wiss. Berlin, Monatsb., p. 843, 1876 (1877) (New Ireland).

Abudefduf biocellatus Fowler and Bean: U. S. Nat. Mus., Proc., vol. 71, p. 15, 1927 (Tahiti).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100; p. 166, 1928 (Apia, Arhno, Makemo).

Chaetodon brownriggii J. W. Bennett: Fish. Ceylon, p. 8, pl. 8, 1828-30 (type loc., Ceylon).

Glyphidodon brownriggii Waite: Australian Mus., Mem., no. 3, p. 192, 1897 (Funafuti, Ellice Islands).—Waite: Australian Mus., Records, vol. 5, p. 3, 1903 (Nauru, Pleasant Island, Marshall Islands).

Abudefduf brownriggii Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 83, 1901 (Guam).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19 p. 128, 1913 (Saonek, Waigiu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 14, 1925 (Guam).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 21, 1925 (Wake Island).

Glyphisodon antjerius Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (1860) (Doreh).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma Island).

Glyphidodon antjerius Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 21, 1869 (Samoa).—Schmeltz: op. cit., Cat. 5, p. 32, 1874 (Samoa; Tonga).—Streets: U. S. Nat. Mus., Bull. 7, p. 98, 1877 (Samoa).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 233, pl. 127, fig. B, 1881 (Samoa; Ponapé).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 229, 1898 (Guam; Rota).

Abudefduf antjerius Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 83, 1900 (1901) (Guam).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 287, pl. 42, fig. 2, 1905 (1906) (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 297, 1911 (Arhno Atoll, Marshalls).

Abudefduf antjerinus Fowler: B. P. Bishop Mus., Bull. 22, p. 35, 1925 (Samoa).

Glyphidodontops antjerius Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1396, 1906 (Upolu).

Glyphisodon punctulatus Cuvier: Hist. nat. Poiss., vol. 5, p. 362, 1830 (type loc., Guam).

Glyphidodon hemimelas Kner: Akad. Wiss. Wien, Sitz., vol. 58, pt. 1, pp. 30, 351, pl. 8, fig. 25, 1868 (type loc., Kandavu, Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Kanathia).

Glyphidodon brownriggii var. *hemimelas* Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 233, 1881.

Pomacentrus littoralis (non Cuvier) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 81, 1900 (1901) (Guam; part).

Abudefduf lacrymatus (non Quoy and Gaimard) Seale: B. P. Bishop Mus., Occ. Papers., vol. 1, no. 3, p. 83, 1900 (1901) (Guam).

Head 2 7/8 to 3; depth 2 1/5 to 2 1/6; D. XIII or XIV, 12, 1 or 13, 1; A. II, 13, 1; tubes 16 or 17 in upper arch of lateral line, pores (3 or 4) 7 or 8 in straight section to caudal base; scales 3 above lateral line, 8 or 9 below; 14 or 15 predorsal scales; snout 3 7/8 to 4 1/5 in head; eye 2 1/2 to 2 2/3; maxillary 3 to 3 1/6; interorbital 3 2/5 to 3 4/5.

Head width 1 2/3 to 1 7/8 in its length. Snout convex, length 3/5 to 2/3 its width. Eye large, hind edge little behind middle in head length. Maxillary reaches about opposite front pupil edge. Teeth compressed, ends rounded, with series of larger, between which alternating series of narrower as if imposed from behind, ends of all in even plane; some teeth extend down on maxillary. Interorbital convex. Suborbital and preorbital edges entire. Gill rakers 10 + 15, lanceolate, slender, equal gill filaments or 2 in eye. Scales with 5 to 10 basal radiating striae; apical denticles 21 to 68, basal elements in 3 or 4 series; circuli very fine.

Largely fuscous, lower or under surfaces but slightly paler. Fins all dull brownish. Black ocellus with narrow bluish edge, large as eye, at bases of last four dorsal spines and small jet black spot size of pupil at bases of last 3 dorsal rays. Iris dull slaty. Pale bluish line from snout tip up and including upper eye edge to bases of third or fourth dorsal spine. Iris slaty. One of medium size differs in the blue line along upper side of head and dorsals, anals and ventrals all more or less dusky.

In the Academy 5 from Apia, 37 to 50 mm. long. The Bishop Museum contains 9 from Guam, 4 Laysan Island? from W. A. Bryan and 7 Palmyra Island from C. Montague Cooke, Jr., in 1913. Also 6 from Guam in 1923. In the National Museum 1 Arhno Atoll, 11 Apia, and 4 Samoa from Steinberger. The Agassiz Museum contains 45 from Apiang, 5 Kingsmills, 31 Society Islands, all from Andrew Garrett. Four from Apia.

East Africa, Mauritius, India, Andamans, Nicobars, East Indies, Melanesia, Micronesia, Polynesia, Hawaii?.

Abudefduf cyaneus (Quoy and Gaimard).

Glyphisodon cyaneus Quoy and Gaimard: Voyage "Uranie," Zool., p. 392, pl. 64, fig. 3, Jan. 20-May 26, 1825 (no type locality).

Abudefduf cyaneus Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 614, 1908 (Suva, Fiji).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 168, 1928 (type of *A. taupou*).

Glyphisodon azureus Cuvier: Hist. nat. Poiss., vol. 5, p. 359, 1830 (on Quoy and Gaimard; Timor and Friendly Islands).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 21, 1869 (Samoa).

Abudefduf taupou Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 288, pl. 43, fig. 3, 1905 (1906) (type loc., Apia; Pago Pago).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 54, 1906 (Faté, New Hebrides).

Head 3 3/5; depth 2 2/3; D. XIII, 12, 1; A. II, 13, 1; tubes 16 (followed by 3 pores) and 9? pores in straight section of lateral line, none extending on caudal base; 3 scales above lateral line, 10 below; 12 predorsal scales; snout 3 3/5 in head; eye 3 1/5; maxillary 3 1/3; interorbital 3 1/4.

Body elongately ovoid. Least depth of caudal peduncle 2 in its length. Head width 2 in its length. Snout obtuse, conic, length half its width. Teeth uniserial, compressed, ends rounded, not truncate. Suborbital and preorbital chain narrow, about 3 1/2 in eye. Gill rakers 6 + 12, lanceolate, equal gill filaments or 2 1/3 in eye. Scales with 8 to 10 basal radiating striae; apical denticles 83 to 104, basal elements in 3 or 4 series; circuli

fine. First dorsal spine 3 1/8 in head; last dorsal spine 2 1/10; fifth dorsal ray 1; second anal spine 1 4/5; seventh anal ray 1 1/6; caudal 1; pectoral 1 1/10; ventral little longer than head. Long cutaneous filament behind end of each dorsal spine.

Deep slaty-blue. Spinous dorsal whitish, with filaments and broad basal area blackish. Same pattern extends out on soft dorsal, though dark basal area broader. Anal largely white, bases of last rays dusky. Caudal dusky basally, terminally broadly whitish. Pectoral pale or whitish, with dusky basally. Ventral whitish basally, terminally dusky. Side of head with some dusky blotches.

One in the Bishop Museum from Faté, 75 mm. long.

East Indies, Philippines, Riu Kiu, Melanesia, Polynesia.

Abudefduf glaucus (Cuvier).

Glyphisodon glaucus Cuvier: Hist. nat. Poiss., vol. 5, p. 355, 1830 (type loc., Guam).

Abudefduf glaucus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 286, 1905 (1906) (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 296, 1911 (Makatea, Makemo and Fakarava, Paumotus).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 136, 1912 (Mangareva, Gambier Islands).—Fowler and Silvester: Carnegie Inst., Marine Biol. Pap., p. 120, 1922 (Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 22, p. 34, 1925 (Samoa).—Fowler and Bean: U. S. Nat. Mus., Proc., vol. 71, p. 15, 1925, (Tahiti, Samoa, Riu Kiu).—Fowler: B. P. Bishop Mus., Bull. 38, p. 24, 1927 (Christmas, Howland and Baker islands).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 169, 1928 (Apia, Mangareva, Makatea, Fakarava, Pago Pago).

Glyphisodon modestus Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (1860) (Doreh, New Guinea).

Glyphidodon modestus Schmeltz: Mus. Godeffroy, Cat. 4, p. 21, 1869 (Samoa).

Glyphisodon phaiosoma Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Samoa).

Glyphidodon brownriggii (non Bennett) Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 232, 1881 (Tonga; Ponapé).—Waite: Australian Mus., Mem., no. 3, p. 192, 1897 (Funafuti, Ellice Islands).

Glypidodon pallidus DeVis: Linn. Soc. New South Wales, Proc., vol. 8, p. 452, 1883 (type loc., Bank's Group).

Abudefduf caesio Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 53, fig. 8, 1906 (type loc., Tubuai, Austral Islands).

Abudefduf zonatus (non Cuvier) Fowler and Silvester: Carnegie Inst., Marine Biol. Pap., p. 120, 1922 (Pago Pago).

Abudefduf imparipennis (non Vaillant and Sauvage) Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 21, 1925 (Johnston and Wake islands).

Head 3 2/5; depth 3; D. XIII, 13, 1; A. II, 13, 1; tubes in upper section of lateral line 17, pores in straight section 6 to caudal base; 3 scales above lateral line, 6 below, 14 predorsal; snout 3 1/2 in head; eye 2 4/5; maxillary 3; interorbital 3 1/8.

Head width half its length. Snout length 2/3 its width, obtuse, length in profile about half of eye. Maxillary small, reaches opposite eye. Teeth uniserial, incisor-like, narrow, compressed. Interorbital convex. Gill rakers 4 + 12, lanceolate, slightly shorter than gill filaments or 1/2 of eye. First dorsal spine 2 3/4 in head, thirteenth spine 2 1/4; second anal spine 2 1/5; third anal ray 1 1/3; least depth of caudal peduncle 2 1/8; caudal 1 1/4; pectoral 1 2/5; ventral 1 1/8.

Dull brownish generally, lower surfaces little paler. Dorsals and anals dusky, other fins pale brownish. Iris slaty.

The Bishop Museum contains the type of *Abudefduf caesio* noted above, 3 from Makatea and 8 from Rarotonga. Also 4 from Johnston Island and 10 from Wake Island as *Abudefduf imparipennis* by Fowler and Ball. The National Museum has a series from Apia, 4 Makatea, 50 Makemo, 1 Fakarava, 2 Mangareva. The Agassiz Museum has 36 from Apia, 1 Mangareva, 25 Makatea. The Academy has 39 from Apia and 47 Pago Pago.

Glyphidodon pallidus seems to be a variant of this species. It is noticed as follows:

Depth 2 1/2; D. XII, 11; A. II, 11; scales 26. Snout shorter than eye. Teeth uniserial, long. Caudal emarginate, lobes rounded. Pale yellowish-blue. Blue line from dorsal base to muzzle on each side. Two curved lines beneath eye. Small oval spots or short streaks above lateral line and extending upon webs of dorsal; streaks on few scales below lateral line. Length 50 mm.

India, East Indies, Philippines, Japan, Melanesia, Micronesia, Polynesia.

Abudefduf leucopomus (Cuvier).

Glyphisodon leucopomus Cuvier: Hist. nat. Poiss., vol. 5, p. 359, 1830 (type loc., Oualan).—Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 189, 1830 (Oualan).

Glyphidodon leucopoma Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 234, 1881 (Apia; Oualan).

Abudefduf leucopomus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 54, 1906 (Tubuai; Nukuhiva; Rarotonga).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 287, pl. 43, fig. 1, 1905 (1906) (Apia; Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 22, p. 35, 1925 (Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 21, 1925 (Wake Island).—Fowler: op. cit., Bull. 38, p. 24, 1927 (Fanning and Tongareva islands).

Glyphisodon filholi Sauvage: Soc. Philom. Paris, Bull., 7th ser., vol. 3, p. 207, 1878 (type loc., Fiji).

Glyphidodon brownriggii (non Bennett) Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 235, pl. 128, fig. B, 1881 (Samoa; Bonham Island; Fatuna) (supposed hybrid between *Glyphidodon brownriggii* and *Glyphidodon uniocellatus*).

Head 2 3/4 to 3 1/4; depth 2 1/2 to 2 2/3; D. XIII, 12; A. II, 11 or 12; tubes 15 to 18 in upper arch of lateral line, and 5 to 7 pores in straight section to caudal base; 3 scales above lateral line, 9 below; 16 to 19 predorsal scales; snout 4 to 4 2/5 in head; eye 2 3/5 to 2 7/8; maxillary 2 7/8 to 3 1/6; interorbital 3 2/5 to 3 3/4.

Head width 1 3/5 to 2 in its length. Snout short, convex, length equals its width. Eye large, hind edge slightly behind middle in head length. Maxillary extends opposite front pupil edge. Interorbital evenly convex. Suborbital and preopercle edges entire. Gill rakers 9 + 14, lanceolate, equal gill filaments, which 2 in eye. Scales with 9 or 10 basal radiating striae; apical denticles 34 to 70; circuli extremely fine.

Dark gray brown above, paler on abdomen and head below. Each scale on sides with 1 to 3 small pale blue spots. Blue line above nostril meeting its fellow on snout above, also above eye and including upper eye edge, back along and above lateral line to origin of upper caudal lobe, often ending in blackish blotch. Short blue line horizontally on preorbital, line follows suborbital from maxillary and another wider across upper row of cheek scales over chin. Fins all pale

brownish, base of soft dorsal dusky. Length 25 to 48 mm.

The Academy has 7 from Apia. The Bishop Museum has 6 from Nukuhiva, 2 from Rarotonga and 1 from Laysan Island?, received from W. A. Bryan. Largest 65 mm. Also 28 from Wake Island. In the National Museum 15 from Apia. In the Agassiz Museum 15 from Apia.

Glyphisodon filholi may be this species. It is described as follows: Depth 2 1/2; D. XIII, 11; A. II, 11; scales 25. Snout shorter than eye, which 3 in head. Spinous dorsal scaly. Caudal emarginate. Body pale to soft dorsal. Each scale along dorsal with purple spot. Hind part of body, soft dorsal, anal and caudal purple. Blue line from snout to eye. Pectoral pale. Outer ventral edge dark. Length 75 mm.

Abudefduf uniocellatus (Quoy and Gaimard).

Glyphisodon uniocellatus Quoy and Gaimard: Voyage "Uranie," Zool., p. 393, pl. 64, fig. 4, 1825 (type loc., Coupang; Timor?; Mariannes).—Cuvier: Hist. nat. Poiss., vol. 5, p. 360, 1830 (Timor; Vanicolo).—Schlegel and Müller: Nat. Ges. Zool., Verhand., vol. 2, p. 23, 1839-44 (Vanikoro).

Glyphidodon uniocellatus Günther: Cat. fishes Brit. Mus., vol. 4, p. 52, 1862 (Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 21, 1869 (Samoa).—Streets: U. S. Nat. Mus., Bull., no. 7, p. 98, 1877 (Samoa).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 234, pl. 128, fig. A, 1881 (Fiji; Solomons; Samoa; Tonga; Marquesas; Futuna).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma Island).—Garman: Mus. Comp. Zool., Bull., vol. 39, p. 238, 1903 (Suva, Fiji).

Glyphydodon uniocellatus DeVis: Linn. Soc. New South Wales, Proc., vol. 8, p. 453, 1883 (South Sea Islands).

Abudefduf uniocellatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 54, 1906 (Faté, New Hebrides).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 288, pl. 43, fig. 2, 1905 (1906) (Apia; Pago Pago).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 614, 1908 (Suva, Fiji).—Fowler: B. P. Bishop Mus., Bull. 22, p. 35, 1925 (Samoa).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 173, 1928 (Samoa, Apia).

Glyphidodon assimilis Günther: Cat. fishes Brit. Mus., vol. 4, p. 52, 1862 (type loc., Borneo; Philippines; Indian Seas).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 21, 1869 (Viti Islands).—Günther: Cruise of "Curacoa" (Brenchley), p. 410, 1873 (Solomons).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 32, 1874 (Viti; Samoa).—Peters: Akad. Wiss. Berlin, Monatsb., p. 843, 1876 (1877) (New Hannover).—Günther: Rept. voyage "Challenger," vol. 1, p. 36, 1880 (Ovalau, Fiji).

The Academy has 16 from Apia. In the National Museum 1 without locality and another labeled "Oahu," were both likely from Fiji?, obtained by the Wilkes Expedition. Also 1 Samoa received from Steinberger. The Bishop Museum has 3 from Faté. The Agassiz Museum has 1 from Suva, 18 Apia and 2 Tongoa on Sancti Espiritu Island in the New Hebrides.

Ceylon, East Indies, Melanesia, Micronesia, Polynesia.

Abudefduf hedleyi (Whitley).

Glyphisodon hedleyi Whitley: Australian Mus., Records, vol. 16, no. 1, p. 20, pl. 1, fig. 5, 1927 (type loc., Dauco Island reef, off Port Moresby, Papua; St. Crispin reef and Michaelmas Cay, Queensland.

Near *A. uniocellatus* but without the light ventral coloring and the dark blotch at the end of the soft dorsal. Length 53 mm.

Abudefduf filamentosus (Macleay).

Gliphidodon filamentosus Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 365, 1882 (type loc., New Guinea).

Abudefduf metallicus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 289, fig. 1, 1906 (1906) (type loc., Apia).

Depth little more than one-third, without caudal; D. XIII, 10; A. II, 10; lateral line 28. Spinous dorsal height equals 1/3 of body depth, spines graduated from first to last; soft dorsal and anal with median rays elongated; caudal lobes much produced. Dark all over, probably purplish in life. Dorsal seems to have been variegated. Caudal lobes black externally. Length 76 mm. (Macleay)

It appears quite likely that *Abudefduf metallicus* in the National Museum, of which 7 specimens, the types, are this species. Also 2 poorly preserved specimens from Samoa through C. H. White. Largest specimen 87 mm. Macleay's description, however, does not mention the large black basal pectoral blotch.

Abudefduf imparipennis (Vaillant and Sauvage).

Glyphisodon imparipennis Vaillant and Sauvage: Rev. Mag. Zool., ser. 3, vol. 3, p. 279, 1875 (type loc., Honolulu).

Abudefduf imparipennis Fowler and Bean: U. S. Nat. Mus., Proc., vol. 71, p. 15, 1927 (Tahiti).

Chromis elaphrus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 457, fig. 23, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 268, 1903 (1905) (Hilo; types).

Head 3 1/4; depth 2 1/4; D. XII, 15, 1; A. II, 11, 1; P. 11, 18; V. I, 5; tubes 20 in upper arch of lateral line, 6 pores in straight section to caudal base and 1 more on latter; 4 scales above lateral line to spinous dorsal origin, 2 to soft dorsal origin, 9 below, 23 predorsal; snout 3 1/2 in head; eye 3; maxillary 3 2/3; interorbital 3 3/4.

Least depth of caudal peduncle 2 in head; head width 1 4/5. Snout length 3/5 its width. Mouth broad, gape short. Maxillary reaches eye, exposed. Teeth narrow, slender incisors, well compressed, uniserial. Nostril at last third in snout. Interorbital broadly convex. Preorbital narrow, and with infraorbital and preopercle edges entire. Gill rakers 4 + 7, lanceolate, 1/2 of gill filaments, which 1 1/2 in eye. Scales with 9 basal radiating striae; apical denticles 80 to 94, basal elements uniserial; circuli very fine. First dorsal spine 2 3/5 in head; fourth dorsal spine 1 3/4, last spine 2 4/5; sixth dorsal ray 1 2/3; second anal spine 2 1/10; first anal ray 1 2/3; caudal 1; pectoral 1 1/8; ventral 1 1/8.

When fresh rich olive on back, shading pale to grayish on sides and white below. Whole posterior flanks, caudal peduncle and soft dorsal and anal, also all of caudal, rich yellowish, though most brilliant on caudal and anal. Spinous dorsal dull olive, with grayish tint on each membrane. Paired fins transparent whitish, ventral more whitish. Predorsal and upper surface of head little darker than elsewhere. Lips and lower surface of head whitish. Iris silvery, with vertically inclined bar of deep neutral tint about wide as pupil.

Each scale on back and side with short gray vertical line. Length 56 mm.

I caught a specimen of this interesting species in a rock pool of the reef on the island of Mokuauia off Laie, Oahu, November 4, 1922, with C. Montague Cooke, Jr. It was scooped out with a hand net, as the undertow receded, from the reef along the eastern slope of the island. No other fish were taken from this particular pool, though in adjacent pools we found numbers of manini, young barracudas, dark tangs, labroids, and gobies. The above specimen now in the Bishop Museum.

The only other specimen I have critically studied is from Maui, obtained by the Wilkes Expedition and in the National Museum. In this connection I also examined the type of *Chromis claphrus* Jenkins from Honolulu, now in the National Museum. It proves to be synonymous, as I had thought in 1922. Jenkins does not show the teeth clearly in his figure. I find them compressed, uniserial and rather pointed. Cheek with 5 rows of scales, of which the uppermost on the infraorbitals, the preopercular flange naked.

Abudefduf amabilis (De Vis).

Glyphisodon amabilis DeVis: Linn. Soc. New South Wales, Proc., vol. 8, p. 452, 1883 (type loc., South Sea Islands).

Abudefduf amabilis Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 54, 1906 (Faté, New Hebrides).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 287, pl. 42, fig. 1, 1905 (1906) (Apia).—Fowler: B. P. Bishop Mus., Bull. 22, p. 35, 1925 (Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull., 26, p. 21, 1925 (Wake Island).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 177, 1928 (Apia).

Glyphidodon brownriggii var. *xanthozona* (non Bleeker) Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 234, pl. 127, fig. D, 1881 (Oualan, Futuna, Samoa, Tahiti, Ponapé).

Head 3 1/4; depth 1 4/5; D. XII, 13, 1; A. II, 13, 1; tubes 17 in upper section of lateral line and 7 pores in lower section to caudal base, also 1 more on latter; 4 scales above lateral line, 8 below, 15 predorsal; snout 3 1/3 in head; eye 3 2/5; maxillary 3 1/3; interorbital 3 3/5. Least depth of caudal peduncle 2; head width 1 1/2; first dorsal spine 4 1/5; twelfth 2; second anal spine 2 1/10; seventh dorsal ray 1 3/5; seventh anal ray 1 2/5; caudal 1; pectoral 1 1/8; ventral 1. Color of usual pattern, dark in alcohol, with pale transverse band about middle of spinous dorsal and another across caudal peduncle at caudal base. Length 80 mm.

In the Bishop Museum 8 from Faté, of which an interesting variant noted above. Also 1 from Shortland Island, 2 Nukuhiva and 2 from Laysan Island?, obtained by W. A. Bryan. Largest 85 mm. Also 1 from Wake Island by the Tanager. In the National Museum 1 from Tuamotus? and 1 probably Fiji or Samoa?, obtained by the Wilkes Expedition. Also a series from Apia through the Bureau of Fisheries. The Agassiz Museum has 31 from Apia. The Academy also has a large series from Apia.

Philippines, Japan, Micronesia, Polynesia, Hawaii.

Abudefduf albofasciatus (Hombron and Jacquinot) (fig. 56).

Glyphisodon albofasciatus Hombron and Jacquinot: Voyage "Astrolabe," Zool., vol. 3, p. 49, pl. 5, fig. 4, 1853 (type loc., Poulolant group of Borneo Island; Malaysia).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 32, 1874 (Viti Islands).

Abudefduf albofasciatus Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 22, 1925 (Johnston and Wake islands).

Head 2 1/2 to 3; depth 1 3/4 to 2; D. XII, 16, 1 or 17, 1; A. II, 13, 1 to 15, 1; tubes 20 to 26 in upper

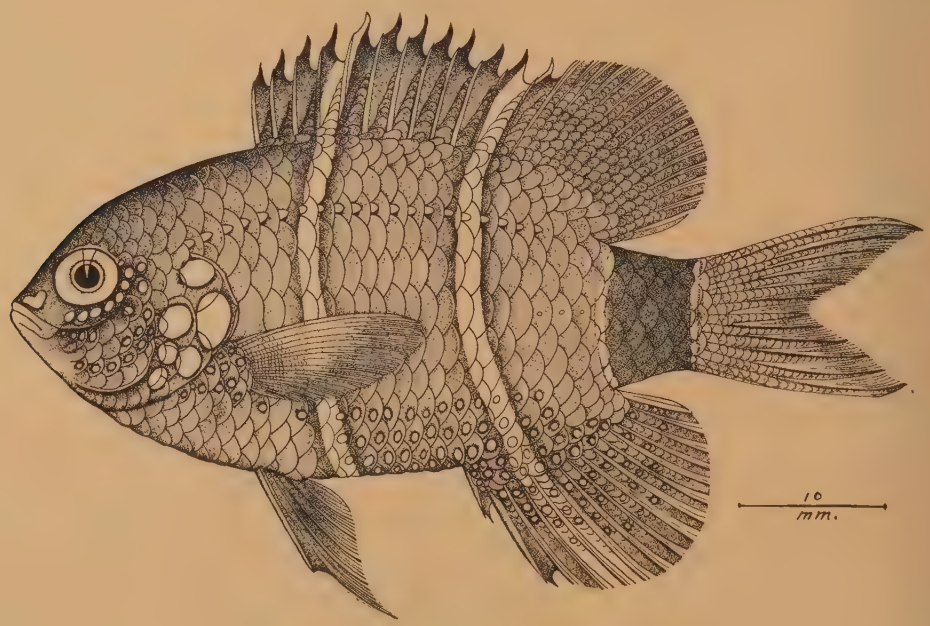

FIGURE 56.—Drawing of *Abudefduf albofasciatus*.

section of lateral line, 4 pores in lower or straight section to caudal base and 1 or 2 more on latter; 3 scales above lateral line, 8 or 9 below; 16 to 20 predorsal scales; snout 3 2/5 to 3 3/4 in head; eye 2 1/8 to 3 2/5; maxillary 3 1/3 to 3 1/2; interorbital 2 1/8 to 3.

Body well compressed, rather deeply ovate and deepest about first 2/5 its length, edges all convexly rounded. Caudal peduncle well compressed, length 4/5 its least depth, which 2 in head.

Head well compressed, width 1 2/3 its length, upper profile little more inclined. Snout conic, length 3/4 its width. Eye little elevated, hind pupil edge midway in head length, diameter equals snout or 1 1/5 in interorbital. Mouth terminal, jaws about even. Maxillary reaches opposite eye; expansion 2 1/6 in eye. Lips thin, entire, rather narrow. Teeth uniserial, slender, compressed, ends rounded to rather obtuse, but not notched. Tongue slender, pointed, free in front. Nostril simple small pore at last fifth in snout. Interorbital convex. Infraorbital and preopercle edges entire.

Gill opening extends forward opposite front pupil edge. Gill rakers 3 + 7, filaments 1/6 of gill filaments, which 1 3/4 in eye. Pseudobranchiae long as gill filaments. Isthmus constricted narrowly forward, with slight branchiostegal fold across.

Scales with 9 or 10 basal parallel striae marginally; apical denticles 74 or 75, with 1 to 3 transverse series of basal elements; circuli fine. Front half of snout and mandible entire. Cheek with 3 rows of scales below suborbital edge to preopercle ridge. Vertical fins covered with fine scales, at least over basal half of each of rayed fins. Scales largest on middle of side of body, become little smaller about body edges. Tubes in upper section of lateral line simple, large; pores in straight section small.

Dorsal spines pungent, graduated up to fifth, which largest or 1 3/4 in head. Soft dorsal rounded, fourth ray 1 2/5. First anal spine 1/3 of second, which 1 2/3 in head. Soft anal rounded, fifth ray 1 1/3 in head. Caudal well forked, pointed, equals head. Pectoral equals head. Ventral very slightly less than head, spine half of fin.

In alcohol seal-brown, becoming slightly paler or ecru drab on lower surface of head, chest and breast. White transverse band, scale in width, from fifth predorsal scale down to opercle; second similar white band from fourth to sixth dorsal spines down to vent; third white band from behind last dorsal spine to anal base, slightly before its middle; caudal peduncle with transverse black band 3 scales wide, with whitish bordering line in front and behind. Pale blue streak curves along infraorbital. Cheek and opercle with some pale blue spots, little larger on latter. Short pale blue bar on preorbital. Iris golden-brown. Dorsals and anals terminally dusky-brown. Caudal pale yellowish basally, becomes gray-white terminally. Pectoral pale olive, base dusky. Ventral blackish, pale dusky basally. Anal base spotted with pale blue.

Fifteen from Wake Island and 2 from Johnston Island, 29 to 68 mm., in the Bishop Museum.

This species has not been found since originally described or for 73 years. A comparison with the original figure shows it to be the same. Hombron and Jacquinot give D. XIII, 18, which is 1 more spine than any of my specimens and they likely counted the last divided dorsal ray as 2. They give A. II, 12. Their figure shows the blue spots on the cheek and lower sides of the head. It has, however, the caudal base and that of the soft dorsal dark bluish and other portions broadly pale, that of caudal with narrow brown border. Moreover the first white band extends only from the shoulder close behind pectoral base and down to that of ventral. The second begins below fifth and sixth dorsal spines and continues to vent. Third crosses middle of caudal peduncle parallel with equally broad dark or blackish caudal base, though leaves front portion of caudal peduncle equally broad as white band. Ventral pale, lower front edge bluish. Bleeker has apparently confused this species with his *Glyphisodon xanthozona* calling it *Glyphidodontops albofasciatus* (Nat. Verh. Holl. Maatsch. Wet. Harlem, Mem. Pomac., 3rd ser., vol. 2, no. 6, p. 136, 1877). He says the formula given by Hombron and Jacquinot as D. XIII, 18, is evidently an error for D. XIII, 13. He also says these authors describe the teeth as uniserial and notched, but that they are certainly simple. His figure (Atlas ichth., vol. 9, pl. [6] 405, fig. 6, 1877) will show the discrepancies.

East Indies, Polynesia.

Abudefduf xanthozona (Bleeker).

Glyphisodon xanthozona Bleeker: Nat. Tijds. Ned. Ind., vol. 4, p. 283, 1853 (type loc., Cauer, Sumatra).

Glyphidodon xanthozona Schmeltz: Mus. Godeffroy, Cat. 4, p. 21, 1869 (Samoa).—Günther: Rept. voyage "Challenger," vol. 1, p. 36, 1880 (Levuka, Fiji).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 234, pl. 127, fig. D, 1881 (Ovalau; Futuna; Tahiti; Samoa: Ponapé).

According to Bleeker's figure white transverse band at occiput, 2 on body obliquely down behind, caudal peduncle with white transverse band, black blotch at bases of last dorsal rays and hind caudal edge emarginate.

In the Agassiz Museum 4 from the Kingsmills, obtained by Andrew Garrett.

Abudefduf zonatus (Cuvier).

Glyphisodon zonatus Cuvier: Hist. nat. Poiss., vol. 5, p. 361, 1830 (type loc., New Guinea; Vanicolo).—Schlegel and Müller: Nat. Ges. Zool., Verhand., vol. 2, p. 24, 1839-44 (northeast coast New Guinea; Vanikoro).

Glyphidodon zonatus Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 234, pl. 127, fig. E, 1881 (Yap; Samoa; Ponapé).

Abudefduf zonatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 55, 1906 (Nukuhiva, Marquesas).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 286, 1905 (1906) (Apia; Pago Pago).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 297, 1911 (Jaluit, Marshalls).—Fowler and Silvester: Carnegie Inst., Marine Biol. Pap., p. 120, 1922 (Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 22, p. 35, 1925 (Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 21, 1925 (Wake Island).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 179, 1928 (Apia, Jaluit).

Glyphidodon cingulatus Kner: Akad. Wiss. Wien, Sitz., vol. 56, p. 725, 1867 (type loc., Samoan Islands).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 21, 1869 (Viti Islands).

Glyphodon albocinctus Kner: Akad. Wiss. Wien, Sitz., vol. 56, pl. 4, fig. 2, 1867 (no type locality).

Glyphidodon albocinctus Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, p. 351, 1868 (Fiji).

Glyphidodon leucozona (non Bleeker) Kner: Akad. Wiss. Wien, Sitz., vol. 57, p. 350, 1861 (Savay, Samoa). —Schmeltz: Mus. Godeffroy, Cat. 5, p. 32, 1874 (Viti Islands).

Glyphidodon brownriggi (non Bennett) Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 232, pl. 127, figs. A, C, F, 1881 (Society Islands, Samoa, Bonham Islands).

Abudefduf brownriggii Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 83, 1900 (Guam).

Abudefduf lacrymatus (non Quoy and Gaimard) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 83, 1900 (Guam; part).

In the National Museum 1 from Fiji and 3 others without locality, likely from Fiji or Samoa, obtained by the Wilkes Expedition. Also 10 from Apia and 2 from Jaluit through the Bureau of Fisheries. The Bishop Museum contains broken remains of 2 very small specimens. They still show the 2 black dorsal ocelli and the white anterior transverse band as seen in Günther's figure of *Glyphidodon brownriggii* (pl. 127, fig. C). Obtained at Agaña, Guam. Also 4 from Wake Island. The Agassiz Museum has 2 from Apia. The Academy has 17 from Pago Pago and 2 from Apia.

Infraorbital scaly. Caudal with submarginal dark band above and below.

East Indian region, Melanesia.

Abudefduf bankieri (Richardson).

Glyphisodon bankieri Richardson: Rept. British Assn. (Ichth. China Japan), p. 253, 1846 (type loc., Hong Kong, China Seas).

Gliphidodon bankieri Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 365, 1882 (New Guinea).

A very handsome small species much like contour of *Abudefduf filamentosus*, with filamentous soft dorsal, anal and caudal lobes. Head and body largely with pale or white spots. Soft vertical fins and caudal pale to yellow. Dark suprascapular scale.

East Indies, Philippines, China, Queensland, Melanesia.

Hemiglyphidodon plagiometopon (Bleeker) (fig. 57).

Glyphisodon plagiometopon Bleeker: Nat. Tijds Ned. Ind., vol. 3, p. 67, 1852 (type loc., Singapore).

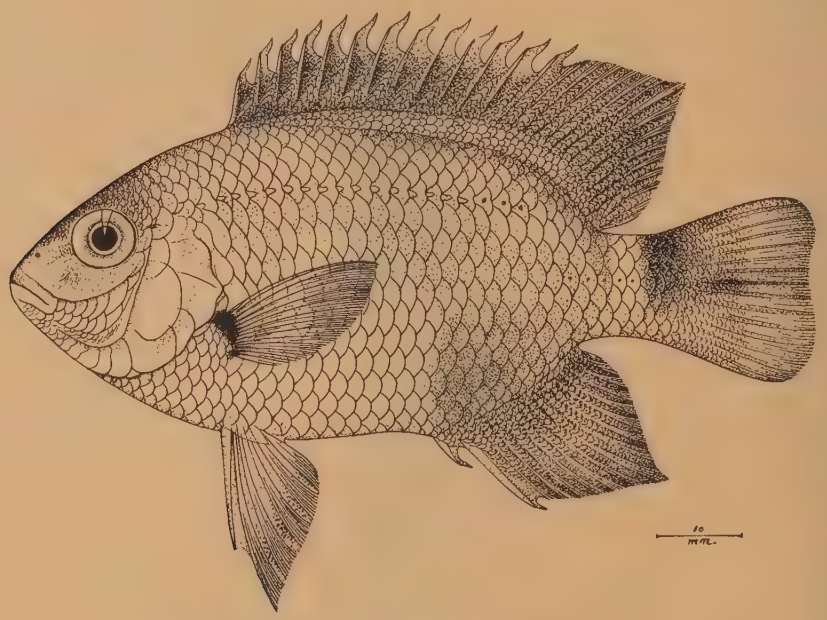

FIGURE 57.—Drawing of *Hemiglyphidodon plagiometopon*.

East Indies, Philippines, Riu Kiu, Japan, Melanesia, Micronesia, Polynesia.

Abudefduf anabatoides (Bleeker).

Glyphisodon anabatoides Bleeker: Bataviaasch Genoot., Verh. (Labr. Cten.), vol. 21, p. 28, 1846-47 (type loc., Java).

Gliphidodon anabatoides Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 365, 1882 (New Guinea).

Glyphidodon plagiometopon Schmeltz: Mus. Godeffroy, Cat. 4, p. 21, 1869 (Samoa).

Gliphidodon plagiometopon Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 365, 1822 (New Guinea)

Abudefduf plagiometopon Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 128, 1913 (Saonek, Waigiu).

Hemiglyphidodon plagiometopon Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 185, 1928 (New Guinea).

Easily known by the extremely long, fine gill rakers, 70 to 80 on the first arch.

One in the National Museum from New Guinea.

Seychelles, East Indies, Melanesia, Polynesia.

Plectroglyphidodon johnstonianus Fowler and Ball (fig. 58).

Plectroglyphidodon johnstonianus Fowler and Ball: Acad. Nat. Sci. Philadelphia, Proc., p. 271, 1924 (type

loc., Johnston Island).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 22, 1925 (reference).

Only the type known.

sixth dorsal ray 2 1/4; third anal spine 3 1/4; seventh anal ray 2 1/8; caudal 1 1/2; pectoral 1 1/5; ventral 1 3/5. Length 165 to 215 mm.

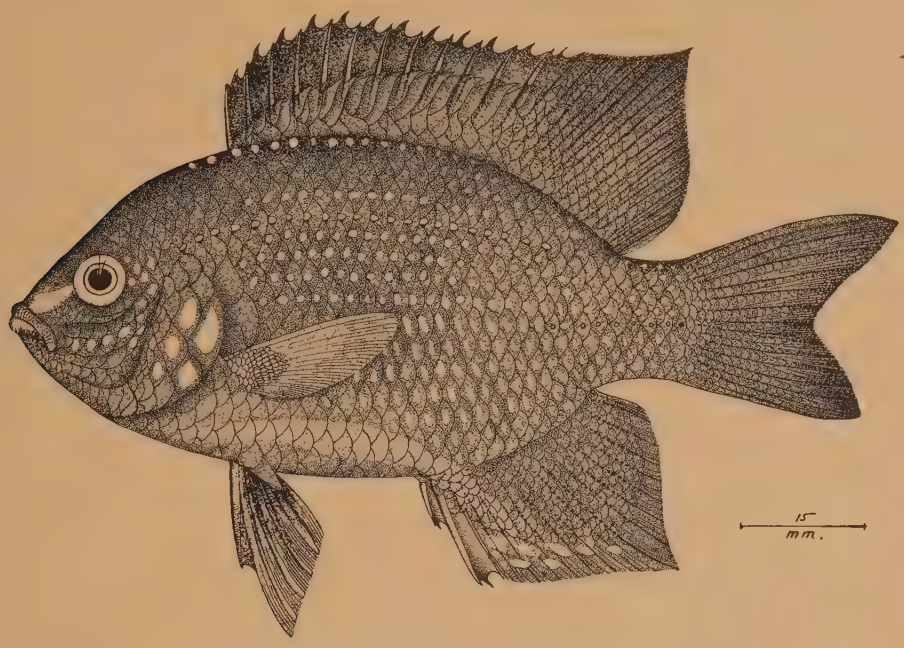

FIGURE 58.—Drawing of *Plectroglyphidodon johnstonianus*.

LABRIDAE

Xiphochilus quadrimaculatus Günther.

Xiphochilus quadrimaculatus Günther: Rept. voyage "Challenger," vol. 1, p. 45, pl. 20, fig. C, 1880 (type loc., Arafura Sea).

Head 3; depth 3 1/3; D. XII, 8; A. III, 10; scales 30 in lateral line, 3 above, 10 below; eye 3 1/2 in head from snout tip, little longer than snout; maxillary reaches eye; canines 4 in each jaw, and upper posterior canine; 3 rows of scales on cheek. Rose colored; black spot on lateral line below sixth and seventh scales, and another above end of lateral line on caudal. Length 102 mm. (Günther)

Choerodon anchorago (Bloch).

Sparus anchorago Bloch: Nat. ausländischen Fische, pt. 5, p. 108, pl. 276, 1791 (type loc., "received from the Holland Auction").

Choerops anchorago Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Pelew Islands).—Schmeltz: op. cit., Cat. 5, p. 33, 1874 (Pelew Islands; Tahiti).—Peters: Akad. Wiss. Berlin, Monatsb., p. 843, 1876 (1877) (New Hannover).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 238, 1881 (Pelew Islands; Yap).

Choerops macrodon Schmeltz: Mus. Godeffroy, Cat. 6, p. 16, 1877 (Pelew Islands; Ponapé).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 585, 1882 (New Guinea).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 35, 1885 (Rubi, New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 55, 1906 (Faté; Shortland Island).

Head 2 2/3; depth 2 1/3; D. XIII, 7, 1; A. III, 9, 1; scales 27 in lateral line to caudal base and 2 more on latter; 3 scales above lateral line, 8 below; 9 predorsal scales; snout 2 1/8 in head from snout tip; eye 5 1/2; maxillary 2 7/8; interorbital 4. Least depth of caudal peduncle 2 1/2 in total head length. Head width 2 in its length. First dorsal spine 4 2/5; last spine 3 1/10;

In the Bishop Museum 1 from Shortland Island and 1 from Faté. The National Museum has a specimen from New Guinea 228 mm.

Jouan mentions this species from Baie du Sud in New Caledonia as *Labrus macrodontus* (Soc. Cherbourg, Mem., vol. 8, p. 268, 1861): Back violet, with band extending along side of tail, also head and back with reddish dots and pectoral base with transverse blue band.

India, East Indies, Philippines, Queensland, Micronesia, Melanesia.

Choerodon schoenleinii (Valenciennes).

Cossyphus schoenleinii (Agassiz) Valenciennes: Hist. nat. Poiss., vol. 13, p. 104, 1830 (type loc., Celebes).

Choerops ommopterus Günther: Rept. voyage "Challenger," vol. 1, p. 46, 1880 (south of New Guinea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 585, 1882 (New Guinea).

Differs from *Choerodon anchorago* largely in color and smaller head. Pale spot below soft dorsal and smaler black blotch at origin of soft dorsal. Head and tail with blue lines and each scale on back with blue spot.

East Indies, Philippines, China.

Choerodon cyanodus (Richardson).

Labrus cyanodus Richardson: Ann. Mag. Nat. Hist. London, vol. 2, p. 355, 1843 (type loc., Port Essington, Australia).

Choerops cyanodon Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 239, 1881 (Tahiti).

No posterior canines. Preopercle entire. Scales on cheek not imbricate. Back crossed by 3 or 4 dark bands (sometimes indistinct) separated by shining silvery interspaces. Cheek with irregular bluish lines. Dorsal and anal with yellow longitudinal lines. Caudal

gray, with small round transparent spots and intramarginal line. Upper pectoral edge blackish. Length 660 mm. (Günther)

Jouan describes as *Crenilabrus ?* or *Serranus ?* from Port de France, New Caledonia, evidently *Choerodon oligacanthus* (Bleeker). (See Mem. Soc. Cherbourg, Mem., vol. 8, p. 271, 1861): D. XIII, 7; A. III, 10. Body compressed, elongate, depth 2 1/2? Head smooth. Snout somewhat obtuse. Lips slender. Each jaw with strong, irregular, conic teeth. Preopercle finely denticulate. Scales large. Lateral line incomplete. Caudal rounded. Green, with transverse black bands. Horse-shoe like black spot each side on lateral line. Length 160 mm.

Australia, Polynesia.

Lepidaplois mesothorax (Schneider).

Labrus mesothorax Schneider: Systema ichth., Bloch, p. 254, 1801 (type loc., East Indies).

Cossyphus mesothorax Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Kandavu).

Bodianus mesothorax Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).

Differs from *Lepidaplois bilunulatus* in very pointed head, preopercle limb scaly and large scales on opercle. Head and front of back dusky, bounded behind by black band from last dorsal spines to pectoral axil. Black blotch at pectoral base and first 2 dorsal membranes black. Rest of body below and posteriorly yellowish.

East Indies, Philippines, Queensland.

Lepidaplois perdito (Quoy and Gaimard).

Labrus perdito Quoy and Gaimard: Voyage "Astrolabe," Zool., vol. 3, p. 702, pl. 20, fig. 4, 1834 (type loc., Tongatabu).

Cossyphus atrolumbus Günther: Cat. fishes Brit. Mus., vol. 4, p. 105, 1862 (Minerva Reef, southwest Pacific; Saumarey Reefs; Aneiteum).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 241, 1881 (Tongatabu; Aneiteum; Minerva Reef).

Bright coppery-red to greenish-red. Head spotted with yellow. Pale yellowish blotch or band on back just beyond pectoral tip. Vertical fins yellowish, paired fins pinkish.

Evidently described by Jouan as *Bodianus* from Port de France, New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 273, 1861): D. XIII, 14; A. II, 12. Depth 2 4/5 in total. Snout small. Numerous teeth in cards. Opercular spines 2. Scales very large. Lateral line parallel with curvature of back. Wine color. White vertical band at middle of body. Some black vertical bands. Fins yellowish. Length 90 mm.

Mauritius, East Indies, Japan, Melanesia, Polynesia.

Lepidaplois bilunulatus (Lacépède).

Labrus bilunulatus Lacépède: Hist. nat. Poiss., vol. 3, pp. 454, 526, pl. 31, fig. 2, 1802 (type loc., "Great Equatorial Ocean" [Indo-Pacific]).

Harpe bilunulata Smith and Swain: U. S. Nat. Mus., Proc., vol. 5, p. 137, 1882 (Johnston Island).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 503, 1901 (Honolulu).

Cossyphus bilunulatus Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 240, pl. 130, 1881 (Hawaiian islands).—Scale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 17, 18, 1902 (Honolulu).

Lepidaplois bilunulata Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 458, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 528, 1902 (1904) (Honolulu).

Lepidaplois bilunulatus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, pl. 24, 1903 (1905).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 22, 1925 (French Frigates Shoal, Gardner and Laysan islands).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 207, 1928 (Hawaii, Honolulu).

Cossyhus albotaeniatus Valenciennes: Hist. nat. Poiss., vol. 13, p. 102, 1839 (type loc., Hawaiian islands).

Lepidaplois albotaeniatus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 278, 1903 (1905) (Honolulu; Hilo).

Lepidaplois strophodes Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 190, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 280, pl. 23, 1903 (1905) (Honolulu).

Lepidaplois hirsutus (non Lacépède) Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 22, 1925 (French Frigates Shoals, Gardner and Laysan islands).

Lepidaplois macrourus (non Lacépède) Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., vol. 16, 4th ser., p. 675, 1927 (Bishop Museum cast of Laysan example).

White to pale rosy, with 2, 3 or more dark brown longitudinal lines on side of head, extending back on trunk as line to each row of scales, becoming yellowish on tail. Vertical fins largely yellow, with black spot on second dorsal membrane. Large black blotch at base of soft dorsal posteriorly, larger and usually extends over all of anal base in young.

The National Museum has 1 from Maui secured by the Wilkes Expedition. Also through the Bureau of Fisheries 6 Hawaiian specimens including the type of *Lepidaplois strophodes* and 1 from Johnston Island. In the Bishop Museum 18 from Honolulu. In the Honolulu markets I examined 87 specimens in immature stages and 500 adults, during November and December, 1922, and January, 1923. One from French Frigates Shoal, 1 Gardner and 2 Laysan in 1923 as *Lepidaplois hirsutus*. The Agassiz Museum has 7 Hawaiian specimens obtained by Andrew Garrett and an adult from Honolulu received from W. H. Jones.

Mauritius, Ceylon, East Indies, Philippines, Polynesia, Hawaii.

Lepidaplois modestus (Garrett) (Pl. XXXVI, *B*).

Crenilabrus modestus Garrett: California Acad. Sci., Proc., vol. 3, p. 106, 1863 (1864) (type loc., Hawaiian islands).

Cossyphus modestus Günther: Mus. Godeffroy, Jour. vol. 7, pt. 15, p. 241, pl. 129, fig. B, 1881 (Honolulu) [figure incorrect].

Cossyphus (*Diastodon*) *modestus* Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 18, 1902 (Honolulu).

Lepidaplois modestus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 384, 1923 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 29, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 22, 1925 (French Frigates Shoal and Laysan).—Fowler: op. cit., Bull. 38, p. 24, 1927 (Honolulu).

Lepidaplois atrorubens E. K. Jordan: U. S. Nat.

Mus., Proc., vol. 66, p. 23, pl. 1, fig. 3, 1925 (type loc., (Honolulu).

Head 2 2/3 to 2 5/6; depth 2 1/2 to 2 2/3; D. XII, 10, 1; A. III, 12, 1; scales 32 in lateral line to caudal base and 2 more on latter; 7 scales above lateral line, 13 below; 17 predorsal scales; snout 2 7/8 to 3 in head; eye 6 to 8 1/5; maxillary 2 1/3 to 2 7/8; interorbital 3 1/10 to 3 2/3.

Body well compressed, form rather evenly fusiform. Least depth of caudal peduncle 2 1/10 to 2 1/5 in head. Head pointed, profiles alike, compressed, width 1 3/4 to 2 in its length. Snout conic, width 1 1/10 in its length. Eye with hind edge midway in head, diameter 2 1/4 in snout. Maxillary reaches opposite eye, largely concealed. Two broad bony dental plates in each jaw, bordered by row of enlarged conic canines, of which 4 forward in each jaw largest and flaring forward; strong upper canines each side posteriorly near rictus. Nostrils small, together; front one at last fourth in snout. Interorbital broadly convex. Preopercle edge with minute obsolete denticles.

Gill opening extends forward opposite eye center. Gill rakers 6 + 11, short, lanceolate, 2 1/2 in gill filaments, which 1 2/5 in eye.

Scales with 17 basal radiating striae. Scales smaller along bases of fins and breast, much smaller on head, especially cheeks, where 14 rows. Lateral line with tubes rather slender, well exposed and few small branches, all contracted so tubes all with simple appearance.

Soft dorsal and anal rounded; first dorsal spine 4 7/8 to 5 in head, last 3 1/4 to 3 2/3; seventh dorsal ray 2 2/5 to 2 3/4; third anal spine 3 2/5 to 3 3/4; fifth anal ray 2 3/4 to 3 1/3. Caudal deeply emarginate, pointed above and below, when expanded median ray longest of fin, length 1 1/10 to 2 1/8 in head. Pectoral short, rather broad, 1 2/3 to 1 3/4. Ventral long, reaches anal, spine 2/3 of fin, which 1 1/8 in head.

Dull brown generally, but little paler below, though some dark marblings on head both above and on under surface. Spinous dorsal dusky marginally or over greater upper area, formed as more or less distinct blackish blotch over second and third spines, but not reaching base of fin. Soft dorsal and pectoral pale brown. Anal whitish, with broad dusky-brown border its whole extent. Caudal with upper and lower edges broadly dusky-brown, median rays pale brown. Pectoral pale brown. Ventral with inner faces grayish, outer face with first 2 long rays dusky. Iris dull brown. Length 353 to 510 mm.

In the Bishop Museum 4 from Honolulu. I also saw 50 specimens in the Honolulu markets in November and December, 1922. One from French Frigates Shoal and 1 Laysan, in 1923. Some of these specimens still show traces of the pale spot below the soft dorsal as indicated in Günther's copy of Garrett's figure. This is somewhat crude as the scales about the bases of the dorsals and anals are entirely too small. In the National Museum 1 Hawaiian specimen and the type of *Lepidaplois atrorubens*.

E. K. Jordan has recently redescribed *Lepidaplois modestus* as new. He was led into this apparently by giving too much credence to Günther's reproduction of Garrett's figure of *Crenilabrus modestus*. In Garrett's original description the scales are given as 33 in the lateral line and 12 below, also 10 rows counted across the side of the caudal peduncle. Garrett also carefully notes that "the colors, which are no doubt considerably changed, were taken from the dead fish." Garrett's figure, as published by Günther, shows 47 scales and not "about 53" as Jordan states. It cannot be a *Diastodon* and I believe it to be simply an inaccurate drawing. Ball kindly sent a fresh specimen obtained in the Honolulu market October 27, 1925, which is about 510 mm. long.

Verreo Jordan and Snyder was erected on the unreliable character of the presence of the inner dental plates in both jaws. Now these are present in some form or other in my entire series of this species.

Lepidaplois axillaris (Bennett).

Labrus axillaris Bennett: Zool. Soc. London, Proc. Comm., pt. 1, p. 166, 1831 (type loc., Mauritius).

Cossyphus axillaris Valenciennes: Hist. nat. Poiss., vol. 13, p. 95, pl. 371, 1839 (Ulea).—Günther: Cat. fishes Brit. Mus., vol. 4, p. 103, 1862 (Aneiteum).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 239, pl. 28, fig. E, 1881 (New Hebrides, Society Islands, Tahiti, Tuamotu).

Harpe axillaris Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 85, 1901 (Guam).

Lepidaplois axillaris Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 55, 1906 (Rarotonga).

Head 3 1/3; depth 3 1/8; D. XII, 10, 1; A. III, 12, 1; scales 30 in lateral line to caudal base and 3 more on latter; 5 scales above lateral line, 12 below; 28 predorsal scales; snout 3 1/3 in head measured from its own tip; eye 4 1/3; maxillary 2 2/3; interorbital 3 3/5 Least depth of caudal peduncle 2 in head length. Head width 2 1/8 in its length. First dorsal spine 4 in head, last spine 1 7/8; second anal spine 1 7/8; second anal ray 1 3/4; caudal 1 1/4; pectoral 1 2/5; ventral 1 1/2. Length 125 to 172 mm.

In the Bishop Museum 2 from Guam, 1 from Rarotonga. In the Agassiz Museum 1 from Society Islands, obtained by Andrew Garrett.

Red Sea, East Africa, Mauritius, Madagascar, Melanesia, Micronesia, Polynesia.

Lepidaplois oxycephalus (Bleeker).

Cossyphus oxycephalus Bleeker: Akad. Amsterdam, Verslagen, vol. 14, p. 129, 1862 (type loc., Japan).

Cheilinus oxycephalus Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 586, 1882 (New Guinea).

Verreo oxycephalus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 281, fig. 120, 1903 (1905) (Kailua).

Head 2 2/3; depth 2 3/4; D. XII, 11, 1; A. III, 12, 1; scales 33 in lateral line to caudal base and 2 more on latter; 5 scales above lateral line, 11 below; 27 predorsal scales; snout 2 1/3 in head; eye 7 1/4; maxillary 2 3/5; interorbital 4 1/5. Least depth of caudal peduncle 2 3/5 in head. Head width 2 1/5 in its length. Snout conic, width 1 1/2 in its length. Maxillary not quite reaching opposite eye. Teeth uniserial in jaws, graduated smaller posteriorly; 2 broad dental plates cover most of front of upper jaw, inside outer series, leaving narrow naked median arch in which several small conic teeth, like those in outer jaw series; similar dental plates in lower jaw, but without median teeth. Lips broad, fleshy. Hind preopercle edge with notch below, just above which some very small irregular denticles. Gill rakers 5 + 8, short, strong, upper ones bifid, half of gill filaments, which 1 1/2 in eye.

Scales with 49 basal radiating striae, apical striae 108; cheek with 6 rows of scales; scales small and

crowded on median predorsal and front of breast. First dorsal spine 5 1/2 in head; last spine 3 2/3; sixth dorsal ray 2 1/3; third anal spine 2 5/6; sixth anal ray 3. Hind caudal edge emarginate, ends in point above and below, though upper median rays longer than lower, fin 1 1/2 in head. Vent little nearer anal origin than tips of depressed ventrals. Pectoral 2 in head; ventral 2 1/8. Uniform pale brown generally. Jet-black blotch on spinous dorsal at bases of seventh to tenth spines. Length 623 mm.

One in the Bishop Museum from Honolulu, obtained by J. W. Thompson in 1908. Thompson reports 6 to 8 others at different times in the Honolulu markets.

East Indies, Queensland, Japan, Hawaii.

Lepidaplois hirsutus (Lacépède).

Labrus hirsutus (Commerson) Lacépède: Hist. nat. Poiss., vol. 3, pp. 429, 473, pl. 20, fig. 1, 1802 (type loc., Great Gulf of India).

Lepidaplois hirsutus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 208, 1928 (type of *L. trotteri*).

Cossyphus macrurus (non Lacépède) Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 240, pl. 129, fig. A. 1881 (Vavau).

Lepidaplois trotteri Fowler and Bean: U. S. Nat. Mus., Proc., vol. 63, p. 20, 1923 (Paumotu Islands).

Like *Lepidaplois bilunulatus* but with black ventrals, lower anal edge black and large black blotch at base of soft dorsal extended obliquely backward to lower surface of caudal peduncle or even along lower edge of caudal fin.

Type of *Lepidaplois trotteri* in the National Museum.

Natal, Mauritius, Philippines, Polynesia.

Verriculus sanguineus Jordan and Evermann.

Verriculus sanguineus Jordan and Evermann: U. S. Fish. Comm., Bull., vol. 22, p. 191, 1902 (1903) (type loc., Hilo).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 281, pl. 25, 1903 (1905) (type).

Head 2 9/10; depth 3 1/2; D. XII, 10; A. III, 12; scales 40, 5 above, 13 below; snout 3 in head; eye 6 1/5, 2 1/10 in snout; mouth cleft 2 4/5; interorbital 4 3/4. Canines 5/4, also posterior 1 each side. Deep red. Upper jaw edge and lower lip golden. Long stripe below eye pure golden. Long stripe from eye along back to caudal base golden, with red shade. Vertical black bar, edged golden, on opercle above and long blackish area covers it from eye to above pectoral. Black spot at base of caudal. Dorsal and caudal golden, first dorsal edged violet and lower half violet. Anal deep blood-red. Pectoral reddish, golden at base. Ventral golden. Length 191 mm. (Jordan and Evermann)

Type in the National Museum from Hilo.

Pseudodax moluccanus (Valenciennes).

Odax moluccanus Valenciennes: Hist. nat., Poiss., vol. 14, p. 227, pl. 408, 1839 (head) (type loc., Moluccas).

Pseudodax moluccanus Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).

A very anomalous labroid, suggestive of *Anampses*, but each jaw with a pair of broadly expanded incisors with a cutting lateral edge. Color dusky, each scale with darker spot and vertical fins with blackish reticulated lines.

Possibly *Odax varius* Valenciennes (Hist. nat. Poiss., vol. 14, p. 229, 1839, type loc., Uléa), incompletely described, may be this species. It is based on a drawing, 178 mm. long.

Zanzibar, Reunion, East Indies, Philippines.

Epibulus insidiator (Pallas).

Sparus insidiator Pallas: Spicilegia zool., pt. 8, p. 41, pl. 5, fig. 1, 1770 (type loc., Java).—Kittlitz: Denkw. Reise Mikronesien, vol. 2, p. 160, 1858 (Uléa).

Epibulus insidiator Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Samoa; Viti Islands).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 250, pl. 137, 1881 (South Sea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 586, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 276, 1883 (southeast coast New Guinea).—Waite: Australian Mus., Mem., no. 3, p. 199, 1897 (Funafuti, Ellice Islands).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma Island).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1398, 1906 (Upolu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 55, 1906 (Tahiti; Raiatea; Faté).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 294, 1905 (1906) (Apia; Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 22, p. 35, 1925 (Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 23, 1925 (Johnston Island).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 213, 1928 (Apra Bay on Guam, Apia).

Unique among all fishes by its extremely protractile jaws. Color uniform dusky brown, pectorals and iris yellowish, dorsals and anals with some longitudinal lines.

In the National Museum 1 from Samoa, 2 Fiji, 1 Samoa or Fiji? though likely from Samoa, obtained by the Wilkes Expedition. Also 7 from Apia through the Bureau of Fisheries. The Bishop Museum has 1 from Faté, 1 Tahiti, and 1 Raiatea. In the Agassiz Museum 1 from Apia, also 3 Society Islands and 1 from the Kingsmill Islands, through Andrew Garrett. Largest 335 mm. The Academy has 5 from Samoa.

Zanzibar, Mauritius, Andamans, East Indies, China, Riu Kiu, Queensland, Melanesia, Micronesia, Polynesia.

Duymaeria flagellifera (Valenciennes).

Ctenolabrus flagellifera Valenciennes: Hist. nat. Poiss., vol. 13, p. 175, 1839 (no type locality).

Duymaeria caeruleomaculata Günther: Cat. fishes Brit. Mus., vol. 4, p. 122, 1862 (type loc., Aneiteum, New Hebrides).

Duymaeria coeruleomaculata Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 244, 1881 (Aneiteum).

Duymaeria flagellifera and *D. nematoptera* are suggestive of *Cheilinus* but with denticulate preopercle. Sexually dichromatic, the males blue and gold and the females with lower fins spotted with blue. Reaches 100 mm.

Günther's *Duymaeria caeruleomaculata* was based on a dried specimen about 142 mm., likely the female. Three in the National Museum, obtained by William Stimpson, 114 to 152 mm. Though without locality likely from Tahiti? or the Bonin Islands?

Philippines, Formosa, China, Japan, Melanesia.

Duymaeria nematoptera (Bleeker).

Crenilabrus nematoptera Bleeker: Nat. Tijds. Ned. Ind., vol. 2, p. 250, 1851 (type loc., Neira, Banda).

Duymaeria nematopterus Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 272, 1883 (southeast New Guinea).

Differs from the preceding in that the dorsal and anal spines end in rather long filaments. Rose-green, head with reddish streaks. Lips red. Dorsal spines and

filaments blackish, fins rosy or rosy-violet. Length 110 mm. (Bleeker)

East Indies, Mozambique.

Labrichthys cyanotaenia Bleeker.

Labrichthys cyanotaenia Bleeker: Nat. Tijds. Ned. Ind., vol. 6, p. 331, 1854 (type loc., Larantuka, Floris).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Samoa).—Schmeltz: op. cit., Cat. 5, p. 33, 1874 (Tahiti).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 220, 1928 (Apia).

Thysanochilus cyanotaenia Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 242, 1881 (Samoa).

Thysanocheilus ornatus Kner: Akad. Wiss. Wien, Denk., vol. 24, pt. 1, p. 5, pl. 3, fig., 1865 (type loc., Upolu, Samoa).

Thysanochilus ornatus Günther: Zool. Soc. London, Proc., p. 241, 1869.

Labrichthys australis Steindachner: Zool. Bot. Ges. Wien, Verh., vol. 16, p. 476, 1866 (type loc., South Seas).

Platyglossus ocellatus Kner and Steindachner: Akad. Wiss. Wien, Sitz., vol. 54, pt. 1, p. 377, fig. 8, 1866 (1867) (type loc., Upolu, Samoa).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Samoa).

Chaerojulis castaneus Kner and Steindachner: Akad. Wiss. Wien, Sitz., vol 54, p. 393, fig. a-b (mouth), 1867 (type loc., Samoa).

A dark colored labroid greatly suggestive of *Halichoeres marginatus* (Rüppell) but with scaly head. About 15 dark blue longitudinal narrow bands. Vertical fins brown, edged narrowly with yellow. Pectoral base black. Reaches 128 mm.

One in the National Museum from Samoa obtained by the Wilkes Expedition. Also small one from Apia without collector's name and 3 from same place through Bureau of Fisheries.

Zanzibar, East Indies, Polynesia.

Labrichthys unilineata (Guichenot).

Cossyphus unilineatus Guichenot: Rev. Zool. Guerin, p. 284, 1847 (type loc., Guam).

Labrichthys unilineata Günther: Cat. fishes Brit. Mus., vol. 4, p. 118, 1862 (copied).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 242, 1881 (copied).—Elera: Cat. fauna Filipinas, vol. 1, p. 550, 1895 (Marianas).

Head very long; body short, oblong, compressed; D. IX or X, 10 to 12; A. III, 12; P. 14; body entirely scaled, scales large. Snout pointed, rounded. Lips compressed. Canines small, 2 in each jaw. Spinous dorsal lower than soft fin, which ends in point. Brown or somewhat reddish, with narrow yellow line beginning at snout, passes below eye to tail above. Fins like trunk. Length 60 mm. (Guichenot)

As the color is evidently given from dried specimens from which most of it has faded, possibly the species is not distinct from *Labrichthys cyanotaenia?*

Labroides dimidiatus (Valenciennes).

Cossyphus dimidiatus Valenciennes: Hist. nat. Poiss., vol. 13, p. 98, 1839 (type loc., Mauritius).—Thiollière: Fauna Woodlark, p. 191, 1857 (Woodlark Island).

Labroides dimidiatus Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Viti Islands).—Schmeltz: op. cit., Cat. 5, p. 33, 1874 (Viti Islands; Tahiti).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 243, 1881 (Pelew Islands, Yap, New Hebrides, Samoa, Hawaiian islands).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma Island).

Callyodon ikan (Montrouzier) Thiollière: Fauna Woodlark, p. 191, 1857 (name in synonymy).

Labroides paradiseus [Bleeker: Nat. Tijds. Ned. Ind., vol. 2, p. 249, 1851 (type loc., Neira, Banda] Schmeltz: Mus. Godeffroy, Cat. 6, p. 16, 1877 (Pelew Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 272, 1883 (southeast New Guinea).

Head 3; depth 4 2/5; D. IX, 10; A. III, 10; scales 42 in lateral line to caudal base and 8 more on latter; 4 scales above, 10 below, 4 predorsal to occiput; snout 3 2/3 in head; eye 4 1/6; maxillary 5 1/2; interorbital 3 2/3.

Body compressed, elongately fusiform, deepest at anal origin. Caudal peduncle compressed, long as deep, least depth 1 7/8 in head.

Head width 2 4/5 in its length. Snout conic, long as wide. Eye with hind edge slightly before middle in head length; diameter 1 1/4 in snout, 1 1/8 in interorbital. Mouth small, terminal, jaws about even. Lips fleshy. Teeth minute, in narrow band in each jaw; upper with pair of outer close set canines, anteriorly directed; lower teeth with pair of wide set canines anteriorly. Front nostril about last third in snout; hind nostril little closer to front one than to eye. Interorbital broadly convex. Gill rakers 8 small weak points on lower half of first arch.

Scales with 10 to 12 basal radiating striae, apical 9 or 10; circuli fine. Sides of head largely scaled, top and muzzle naked. Lateral line high along back below dorsals, then drops continuously to middle of side of caudal peduncle to caudal base; tubes all simple. Ninth dorsal spine 3 1/8 in head; first dorsal ray 2 1/3; third anal spine 3 1/4; first anal ray 2 2/5; caudal 1 1/5, rounded; pectoral 1 3/5; ventral 2.

Generally grayish. Dusky-brown band from side of snout, through eye and expanding at caudal base to embrace most of fin. Dusky-brown band from snout tip to spinous dorsal. Dorsals basally blackish on spinous fin, otherwise brownish. Upper and lower caudal edges whitish. Anal pale. Length 47 mm.

In the Agassiz Museum 1 from the Society Islands, obtained by Andrew Garrett.

Red Sea, Mauritius, India, Andamans, East Indies, Philippines, Melanesia, Micronesia, Polynesia, Hawaii.

Labroides quadrilineatus (Rüppell).

Labrus quadrilineatus Rüppell: Neue Wirbelth., Fische, p. 6, pl. 2, fig. 1, 1835 (type loc., Massaua, Red Sea).

Labroides quadrilineatus Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Savay).

Brownish or blackish, with 2 blue longitudinal bands, space between generally darker than ground color or entirely black. Caudal with whitish edge. (Günther)

Known only from the Red Sea, but reported from Samoa by Schmeltz.

Anampses pterophthalmus Bleeker.

Anampses pterophthalmus Bleeker: Soc. Sci. Ind. Neerl., Act. (Amboina 8), vol. 2, p. 81, 1857 (type loc., Amboina).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Kandavu).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 253, 1881 (Oualan).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 272, 1883 (Engineer Group, New Guinea).

Scales 52. Head without bands, lines or spots. Large black blotch on last dorsal and anal rays. Length 179 mm. (Bleeker)

East Indies, Philippines, Melanesia, Micronesia, Polynesia.

Anampses geographicus Valenciennes.

Anampses geographicus Valenciennes: Hist. nat. Poiss., vol. 14, p. 8, pl. 389, 1839 (no type locality).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Kan-

davu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 586, 1882 (New Guinea).

Resembles *Anampses pterophthalmus* in small scales, about 50. It differs in that the head has rivulated blue lines and each scale on body with vertical short blue bar or spot. No black blotch on soft dorsal or anal. Length 203 mm. (Bleeker)

One in the National Museum, obtained by the Wilkes Expedition in the Tuamotus.

Mauritius, East Indies, Polynesia.

Anampses godeffroyi Günther (Pl. XXXVII, *A*).

Anampses godeffroyi Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 252, pl. 140, 1881 (type loc., Hawaiian islands).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 294, 1903 (1905) (Honolulu).—Jordan and Snyder: (U. S.) Bur. Fish., Bull., vol. 26, p. 215, 1906 (1907) (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 71, 1922 (Hawaii).

Anampses godeffroy Fowler: B. P. Bishop Mus., Bull. 22, p. 29, 1925 (Honolulu).

Anampses evermanni Jenkins: U. S. Fish. Comm., Bull., vol. 19, p. 57, fig. 14, 1899 (1900) (type loc., Honolulu).—Jenkins: op. cit., vol. 22, p. 459, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 528, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 293, fig. 127, 1903 (1905) (Honolulu).

Head 2 5/6; depth 2 2/5; D. IX, 12, 1; A. III, 12, 1; scales 21 in upper section of lateral line, 5 in lower section to caudal base and 2 more on latter; 9 scales above lateral line, 11 below; 10 predorsal scales; snout 2 2/5 in head; eye 8 1/4; maxillary 4 1/8; interorbital 4. Least depth of caudal peduncle 2 1/4 in head. Head width 2 2/5 in its length. First dorsal spine 5 1/4 in head; first branched dorsal ray 2 3/5; third anal spine 4 1/2; third anal ray 3; caudal 1 1/2; pectoral 1 2/5; ventral 2. Dull brown generally. Each scale with base little darker, which color separated from paler terminal color by narrow dull gray-brown line. Traces of pale streaks, spots and bars on head. Lips very pale brown. Iris dull slaty. Dorsals and anals like trunk, with several gray longitudinal lines, edges narrowly pale brown. Caudal brown basally, paler on edges and terminally. Pectoral pale brown. Ventral brown like trunk, with several pale spots and light front edge. Length 252 to 297 mm.

In the Bishop Museum 4 from Honolulu. I also found 6 in the Honolulu markets in December, 1922. The National Museum has 3 from Honolulu. In the Agassiz Museum 2 from Society Islands, larger 228 mm. long. Though dark and vertical lines little distinct these specimens evidently this species, not previously known from outside Hawaii.

Anampses cuvier Quoy and Gaimard (Pl. XXXVII, *B*).

Anampses cuvier Quoy and Gaimard: Voyage "Uranie," Zool., p. 276, pl. 55, fig. 1, 1824 (type loc., Maui, Hawaiian islands).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 459, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 528, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 291, fig. 126, 1903 (1905) (Honolulu; Hilo).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 29, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 23, 1925 (French Frigates Shoal and Laysan Island).

Anampses cuvieri Valenciennes: Hist. nat. Poiss., vol. 14, p. 9, 1839 (Mowi).—Günther: Cat. fishes Brit. Mus., vol. 4, p. 136, 1862 (Hawaiian islands).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 251, pl. 136, fig. A, 1881 (Hawaiian islands).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 506, 1900 (Hawaiian islands).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 71, 1922 (Hawaii).

Anampses caeruleopunctatus (non Rüppell) Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 506, 1900 (Hawaiian islands; part).

Head 3 to 3 1/2; depth 2 2/3 to 2 3/4; D. IX, 12, 1; A. III, 12, 1; scales 22 or 23 in upper section of lateral line, 5 or 6 in lower section to caudal base and 2 more on latter; 6 or 7 scales above lateral line, 10 or 11 below, 11 or 12 predorsal; snout 2 1/3 to 3 1/8 in head; eye 4 4/5 to 7 1/2; maxillary 4 to 5 1/5; interorbital 4.

Head width 2 2/5 in its length. Snout conic, width 1 1/3 in its length. Hind eye edge midway in head length. Two protruding upper incisors, recurving mandibular pair between so all on one plane in closed jaw. Gill rakers 7 + 9, lanceolate, moderate, 1/2 of gill filaments, which 1 1/2 in eye. Scales with 21 to 24 basal radiating striae; apical striae 62 to 73. Dull brown generally, each scale with small white spot, forming longitudinal lines.

The Academy has 6 Hawaiian specimens, of which 2 dried skins, obtained by J. K. Townsend. Length 112 to 218 mm. The Bishop Museum has 14 from Honolulu, 73 to 278 mm. long. I found 11 specimens in the Honolulu markets during November and December, 1922, and January, 1923. One from French Frigates Shoal in 1923. One in the National Museum 103 mm. long, obtained by the Wilkes Expedition in Hawaii. Also 2 from Honolulu through the Bureau of Fisheries. The Agassiz Museum has 3 from Honolulu through W .H. Jones, 6 labeled Hawaiian islands through Andrew Garrett, 2 from Maui, of which 1 also through Andrew Garrett and 3 others from Hawaii.

Anampses melanurus Bleeker.

Anampses melanurus Bleeker: Soc. Sci. Ind. Neerl., Act. (Amboina), vol. 2, p. 79, 1857 (type loc., Amboina).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 252, 1881 (Savaii).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1398, 1906 (Samoa).

Differs from *Anampses cuvier* in the large rounded or oblong yellowish spots on head and thorax, dorsals largely spotted and pectoral base brown. Length 114 mm. (Bleeker)

East Indies, Polynesia.

Anampses neoguinaicus Bleeker.

Anampses neoguinaicus Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (type loc., New Guinea).

Anampses (Anampses) neoguinaicus Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 57, pl. 3, fig. 4, 1878.

Head 3 1/5; depth 3 1/8; D. IX, 12; A. III, 12; scales 25, 5 +2, 3 above, 9 below, 16? predorsal; snout 2 2/5 in head; eye 6. Brown above, golden below. Broad postocular golden-brown band, edged above and below with white line. Opercular flap tipped dusky behind. Iris golden, edged brown. Cheek, lower side of head and thorax with small pearly spots. Each body scale with short, vertical, pearly bar. Dorsals purplish, edged yellow, submarginal line dusky and fin finely dotted with pearly violaceous. Anal edged yellow, submarginal dusky line and several irregular longitudinal pearly lines, more or less broken as spots. Caudal and

paired fins uniform yellowish. Length 140 mm. (Bleeker)

Bleeker distinguishes it from *Anampses cuvier* by the dark postocular band.

Anampses caeruleo-punctatus Rüppell.

Anampses caeruleo-punctatus Rüppell: Atlas Reise Nord. Afrika, Fische, p. 42, pl. 10, fig. 1, 1828 (type loc., Tor, Red Sea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 272, 1883 (Hood Bay, New Guinea).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 228, 1898 (Saypan, Mariannes).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 85, 1900 (Agaña, Guam).—Seale: op. cit., vol. 4, no. 1, p. 55, 1906 (Tubuai, Rarotonga).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 295, 1905 (1906) (Apia).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 222, 1928 (Apia).

Anampses coeruleopunctatus Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Samoa).—Schmeltz: op. cit., Cat. 5, p. 33, 1874 (Tahiti).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 251, 1881 (Tahiti).

Anampses coeruleomaculatus Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, pl. 138, 1881.

Anampses pulcher Regan: Zool. Soc. London, Proc., p. 371, pl. 58, fig. 3, pl. 59, 1913 (type loc., Easter Island; Tahiti).—Fuentes: Mus. Nac. Chile, Bolet., vol. 1, no. 1, p. 306, pl. 7, fig. 3, pl. 10, 1914 (Utuite, Easter Island).

In the Bishop Museum 1 from Agaña on Guam, 1 Rarotonga and 1 Tubuai. One in the Agassiz Museum obtained by Andrew Garrett in the Society Islands. One in the National Museum from Hull's Islands, obtained by the Wilkes Expedition. Also 4 from Apia received through the Bureau of Fisheries.

I cannot find that *Anampses pulcher* is a distinct species, as some of the above specimens have the horizontal directed blue bands, though many variable, much as Regan shows. These variations seem extreme and are asymmetrical on both sides of the head.

Red Sea, Zanzibar, Mauritius, East Indies, Micronesia, Polynesia, Easter Island.

Anampses diadematus Rüppell.

Anampses diadematus Rüppell: Neue Wirbelth. Fische, p. 21, pl. 6, fig. 3, 1839 (type loc., Tor, Red Sea).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 252, pl. 139, 1881 (Samoa; Paumotus; Kingsmills; Huahine Island).—Fowler: B. P. Bishop Mus., Bull. 38, p. 25, 1927 (Fanning Island).

Head 3 to 3 1/8; depth 2 1/2; D. IX, 11, 1 or 12, 1; A. III, 12, 1; scales 21 or 22, 6 in lateral line to caudal base and 2 more on latter; 7 or 8 scales above lateral line, 10 or 11 below, predorsal 12; snout 2 3/5 in head; eye 7 1/4 to 8 1/4; maxillary 4 2/5 to 4 1/2; interorbital 3 3/4 to 4 1/8.

Body oblong, ovate, well compressed, deepest at front of spinous dorsal. Caudal peduncle deep, strongly compressed, length 1 3/5 to 1 4/5 in its least depth, which 2 to 2 1/6 in head.

Head width 2 1/5 to 2 1/3 in its length. Snout conic, width 1 1/4 to 1 1/3 in its length. Eye small, hind edge midway in head length; diameter 2 2/3 to 2 3/4 in snout, 1 3/4 to 1 7/8 in interorbital. Mouth small, terminal. Maxillary 2/5 in snout. Lips fleshy, smooth. Teeth pair of incisors in front of each jaw flaring out forward. Front nostril at last fourth in snout; hind nostril nearer front one than eye. Interorbital convexly elevated. Opercle, subopercle, preopercle and interopercle, suborbital and preorbitals striate.

Gill rakers 6 + 12, short, rather robust points, 2 4/5 in gill filaments, which equal eye.

Scales with 18 to 21 basal radiating striae; imperfect apical radiating striae 40 to 50; circuli very fine. Lateral line continuous, little arched at first, drops midway along side of caudal peduncle; tubes all slender, well exposed, mostly simple. First dorsal spine 4 1/4 in head, spines slender, pungent; first dorsal ray 2 1/4 to 2 1/3; third anal spine 4 1/8 to 4 1/4; first anal ray 2 2/3 to 3; caudal 1 3/5 to 1 2/3, truncate, covex behind as expanded; pectoral 1 1/3 to 1 2/5; ventral 2 to 2 1/8.

Deep uniform brown generally. Each scale with median pale vertical brown or grayish line. Teeth white. Iris brown. Dorsals brown, with 5 or 6 gray and rather waved longitudinal lines, parallel, some broken and sometimes irregular in places. Anals similar and edges of both fins rather narrowly pale. Caudal with gray spots basally and extending well out over most of upper and lower membranes. Paired fins pale olive. Some broken irregular gray lines on cheek and side of head. Length 275 to 313 mm.

In the Agassiz Museum 2 from the Society Islands, obtained by Andrew Garrett.

Red Sea, Zanzibar, Mauritius, East Indies, Micronesia, Polynesia.

Anampses twistii Bleeker.

Anampses twistii Bleeker: Soc. Sci. Ind. Neerl., Act. (Amboina), vol. 1, p. 56, 1856 (type loc., Amboina).

Anampses fidjensis Sauvage: Soc. Philom. Paris, Bull., 7th ser., vol. 4, p. 224, 1879 (type loc., Fiji).

Resembles *Anampses pterophthalmus* in the presence of a black ocellus on last dorsal and anal rays and head without spots. Differs in the large scales, 28 to 30, and the dotted color of the trunk, tail and vertical fins. It differs from all the other species in the black posterior border to the gill opening and black blotch at base of pectoral fin. According to Bleeker reaches 140 mm.

There is little doubt but that *Anampses fidjensis* Sauvage, based on an example 80 mm., is the young.

East Indies, Polynesia.

Stethojulis strigiventer (Bennett).

Julis strigiventer Bennett: Zool. Soc. London, Proc., p. 184, 1832 (type loc., Mauritius).

Stethojulis strigiventer Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Kandavu).—Schmeltz: op. cit., Cat. 5, p. 33, 1875 (Viti Islands).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 254, 1881 (Pelew Islands, Fiji, Vavau, Samoa, Ponapé, Wallis Island).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 273, 1883 (southeast New Guinea).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 299, 1911 (Wotje, Marshalls; Truk and Moen, Carolines; Fakarava, Paumotus).—Fowler: B. P. Bishop Mus., Bull. 22, p. 14, 1925 (Guam).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 232, 1928 (Wotje, Moen).

Head 2 3/4 to 2 4/5; depth 3 1/4 to 3 2/5; D. IX, 11, 1; A. III, 11, 1; tubular scales 20, 5 in lateral line to caudal base and 2 more on latter; 2 or 3 scales above, 9 below, 7 predorsal; snout 3 1/6 to 3 1/2 in head; eye 4 1/4 to 4 7/8; maxillary 4 1/5 to 5; interorbital 4 to 4 2/5.

Body compressed, ovate, deepest near middle of pectoral. Caudal peduncle strongly compressed, long as deep, least depth 2 2/5 to 2 7/8 in head.

Head width 2 3/4 in its length. Snout conic, upper

profile slightly convex, width 1 1/4 to 1 1/3 in its length. Eye with hind edge midway in head; diameter 1 1/2 in snout, 1 to 1 1/5 in interorbital. Mouth small, jaws subequal. Maxillary largely concealed, reaches opposite front nostril. Lips fleshy, with longitudinal folds. Teeth compressed, rather truncate incisors, slightly graduated smaller behind; no posterior canines. Front nostril at last fourth in snout; hind nostril close before front eye edge. Interorbital slightly convex. Gill rakers 10 + 15, short points, 2 1/4 in gill filaments, which 1 3/4 in eye.

Scales with 12 to 21 basal radiating striae; apical radiating striae 6 to 8; circuli fine. Tubes of lateral line simple. Scales on breast and chest smaller than on back. Eighth dorsal spine 2 1/2 to 3 3/4 in head; first dorsal ray 2 2/5 to 3 2/5; third anal spine 3 1/2 to 4 3/5; first anal ray 3; caudal 1 1/4 to 1 1/2, rounded convexly behind; pectoral 1 3/5 to 1 3/4; ventral 2 1/3.

Back olive, lower half paler to silvery-white, especially on lower sides of head and breast. Gray line from side of snout, close below eye back towards pectoral origin. Lower half of trunk and tail with 5 whitish parallel longitudinal lines and brown interspaces each with scattered brown dots or small specks and on tail some pale or light dots. Small black spot at bases of upper median caudal rays. Fins pale brownish, ventrals whitish. Length 37 to 70 mm.

In the Agassiz Museum 1 from Ascension Island in the Marshalls, obtained by Rev. A. A. Strong, April 14, 1877. Also 7 young from Truck Island, Caroline Islands, collected by the *Albatross* and 2 from Fakarava. In the National Museum 11 from Moen and 1 from Wotje. The Bishop Museum has 3 from Guam obtained in 1923.

Mauritius, Mozambique, Zanzibar, Andamans, Nicobars, East Indies, Philippines, China, Riu Kiu, Japan, Queensland, Melanesia, Micronesia, Polynesia.

Stethojulis axillaris (Quoy and Gaimard).

Julis axillaris Quoy and Gaimard: Voyage "Uranie," Zool., p. 72, 1824 (type loc., Hawaiian islands).—Valenciennes: Hist. nat. Poiss., vol. 13, p. 345, 1839 (Hawaiian islands).

Stethojulis axillaris Günther: Cruise of "Curacoa," (Brenchley), p. 410, 1873 (Solomon islands).—Streets: U. S. Nat. Mus., Bull., no. 7, p. 65, 1877 (Honolulu).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 254, pl. 136, fig. C, 1881 (Pelew Islands, Solomons, Fiji, Samoa, Society islands, Hawaiian islands, New Hebrides, Ponapé).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 273, 1883 (Pitt Bay, New Guinea).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 508, 1900 (Hawaiian islands).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 21, 1902 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 459, 1902 (1903) (Honolulu).—Snyder: op. cit., 22, p. 528, 1902 (1904) (Honolulu, Puako Bay, Hilo, off Molokai, 8 to 13 fathoms).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 283, fig. 121, 1903 (1905) (Honolulu, Hilo).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 14, 29, 35, 1925 (Guam; Honolulu; Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 22, 1925 (Lisiansky).—Fowler: op. cit., Bull. 38, p. 24, 1927 (Midway Island).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 234, 1928 (Midway Reefs, Honolulu, Hawaii, Apia, Wotje, Samoa, Oahu).

Hinalea axillaris Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 69, Dec. 1922 (Hawaii).—Whitley: Australian Mus., Records, vol. 16, no. 1, p. 25, 1927 (New Guinea; New Hebrides).

Julis bandanensis Bleeker: Nat. Tijds. Ned. Ind., vol. 2, p. 254, 1851 (type loc., Banda, Neira).

Stethojulis bandanensis Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 297, pl. 45, fig. 2, 1905 (1906) (Apia; Pago Pago).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 300, 1911 (Arhno and Wotje, Marshalls; Funafuti, Ellice Islands).—Fowler: B. P. Bishop Mus., Bull. 22, p. 35, 1925 (Samoa).

Stethojulis fulvoventris Seale: B. P. Bishop Mus., Occ. Pap., vol. 1, no. 3, p. 92, 1900 (type loc., Agaña, Guam).

Stethojulis albovittata (non Bonnaterre) Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 131, 1902 (1903) (Marcus Island).

Head 3 1/2 (2 1/2 in young); depth 2 4/5 to 2 7/8; D. IX, 11, 1; A. III, 11, 1 or 12, 1; scales 21, 4 in lateral line to caudal base and 2 more on latter; 3 scales above lateral line, 8 or 9 below, 8 or 9 predorsal; snout 3 in head (4 in young); eye 5 1/2 (4 in young); maxillary 4 1/4 (3 3/5 in young); interorbital 3 4/5 (4 in young).

Head width 2 1/10 to 2 2/5 its length. Snout conic, width 1 1/8 to 1 1/6 its length. Eye small, hind edge midway in head length. Lip rather narrow. Teeth uniform, compressed, truncate. Single small, simple concealed canine each side posteriorly. Interorbital convex. Gill rakers 10+18, longest moderately lanceolate, 2 3/4 in gill filaments, which 1 1/4 in eye. Scales with 12 to 15 basal radiating striae, apical 12 or 13.

Largely dull brown, paler below. Most scales, especially on breast and abdomen, with whitish edges. Upper half of body with obscure, minute, numerous gray dots. Humeral scale conspicuously white above pectoral origin. Fins all pale brownish. Very small black dot on 2 basal scales of lateral line edged narrowly grayish. Young often with 1 such spot, though with another at last 2 rays of soft dorsal and anal basally and 1 just above snout tip. These caudal spots often quite variable, sometimes third at caudal base or again 1 or all spots may be absent.

In the Academy 8 from Oahu, received from W. H. Jones, 4 Hawaiian from J. K. Townsend, of which 1 a dried skin, 3 from Honolulu and 1 from Apia. Length 33 to 111 mm. The National Museum has 1 from Oahu, 7 Maui and 2 Fiji, obtained by the Wilkes Expedition. Largest 122 mm. Also 7 from Honolulu through T. H. Streets and 41 Hawaiian specimens through the Bureau of Fisheries, of which 31 from Honolulu. As *Stethojulis bandanensis* 10 from Apia, 2 from Wotje and 3 Arhno Atoll. The Bishop Museum has 19 from Honolulu, 2 from Laie on Oahu through C. Montague Cooke III, in 1916, 1 Marcus Island, and 1 Guam, also 4 types of *Stethojulis fulvoventris*. Largest specimen 132 mm. Five from Guam in 1923 and 3 from Lisiansky. As *Stethojulis bandanensis*, 1 from Nukuhiva in the Marquesas, obtained by Alvin Seale in 1902. In the Honolulu markets during December, 1922, and January, 1923, I found upwards of 500 specimens and on most every occasion both *Stethojulis axillaris* and the nominal *Stethojulis bandanensis* were displayed together. The Agassiz Museum has 12 from Honolulu

through W. H. Jones in 1874, 3 from Strong Island in the Carolines through Rev. B. G. Snow. Through Andrew Garrett 1 from Honolulu, 13 Hawaiian, 4 Society Islands, and 1 Gilbert Islands. As *Stethojulis bandanensis* 1 from Funafuti, 1 Arhno Atoll and 5 Apia.

Red Sea, East Africa, Reunion, Madagascar, East Indies, Queensland, Melanesia, Micronesia, Polynesia, Hawaii.

Stethojulis phekadopleura (Bleeker).

Julis (*Halichoeres*) *phekadopleura* Bleeker: Batavia-asch Genoot., Verh. (Bali), vol. 22, p. 8, 1849 (type loc., Boleling, North Bali).

Stethojulis phekadopleura Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Kandavu).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 255, 1881 (Solomons; Ponapé).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 272, 1883 (South Cape, New Guinea).—Weber: Zool. Forsch. Australien (Semon), vol. 5, p. [112] 272, 1895 (coast of New Guinea).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 297, fig. 52, 1905 (1906) (Pago Pago; Apia).—Fowler: B. P. Bishop Mus., Bull. 22, p. 35, 1925 (Samoa).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 237, 1928 (Apia).

Stethojulis phecadopleura Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma).

Stethojulis filholi Sauvage: Soc. Philom. Paris, Bull., 7th ser., vol. 4, p. 225, 1879 (type loc., Fiji).

Head 2 2/3 to 2 3/4; depth 3 1/5 to 3 1/4; D. IX, 11, 1; A. III, 11, 1; scales 20 in upper section of lateral line, continuous with 4 or 5 to caudal base and 1 more on latter; 3 scales above lateral line, 9 below; 7 to 9 predorsal scales; snout 3 to 3 3/5 in head; eye 4 to 4 3/4; maxillary 4 1/5 to 4 1/4; interorbital 3 3/4 to 3 7/8.

Head width 2 2/5 to 2 3/5 in its length. Snout conic, width 1 to 1 1/5 in its length. Eye rather large, hind edge midway in head length. Lips moderate. Teeth uniform, compressed, truncate; single small concealed posterior canine each side. Interorbital convex. Gill rakers 9+12, short firm points, 1/2 of gill filaments, which 1 3/5 in eye. Scales with 12 to 14 basal radiating striae, apical 8 or 9.

Dull brown above, very light brown below. Each row of scales longitudinally in dark area of back with deep brown line. Each scale in lower pale area, comprising 4 series, with deep round brown spot, those in upper row largest and in lowest row smallest and less distinct. On head dark upper area well defined from pale or whitish lower, line of demarcation level with lower eye edge. Obscure brownish streak from rictus till below pectoral base. Iris silvery-white. Dusky spot at caudal base little less than eye, larger than pupil. Fins pale brown, ventral and anal whitish.

Three in the Academy from Apia, 45 to 54 mm. In the National Museum 11 from Apia. In the Agassiz Museum 2 from Apia.

There is but little doubt that *Stethojulis filholi* Sauvage is the same as *S. phekadopleura*. It is described with 3 longitudinal rows of large purple spots upon the 3 inferior rows of scales on the tail.

East Indies, Philippines, Riu Kiu, Japan, Queensland, Melanesia, Micronesia, Polynesia.

Stethojulis kalosoma (Bleeker).

Julis (*Halichoeres*) *kalosoma* Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 289, 1852 (type loc., Amboina; Wahai, Ceram).

Stethojulis kallosoma Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Kandavu).

Stethojulis kalosoma Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 273, 1883 (southeast New Guinea).

Differs from *Sethojulis phekadopleura* in the more slender body, depth 3 2/3 to 3 3/4, and both dorsals with fine oblique blue lines instead of dots. Reaches 126 mm. according to Bleeker.

Red Sea, Zanzibar, East Africa, East Indies, Philippines, China, Japan, Queensland, Polynesia.

Stethojulis interrupta (Bleeker).

Julis (*Halichoeres*) *interruptus* Bleeker: Nat. Tijds. Ned. Ind., vol. 2, p. 252, 1851 (type loc., Banda, Neira).

Stethojulis interrupta Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Kandavu; Samoa).—Schmeltz: op. cit., Cat. 5, p. 33, 1874 (Viti Islands).

Differs from *Stethojulis albovittata* in its more slender body, depth 3 2/3 to 3 4/5, and red line from below eye extends below pectoral base till about opposite middle of fin and begins again on same plane on tail. No red line from rictus to throax. Reaches 120 mm. according to Bleeker.

Red Sea, East Indies, Japan, Polynesia.

Stethojulis albovittata (Bonnaterre).

Labrus albovittatus Bonnaterre: Tableau ichth., p. 108, pl. 98, fig. 399, 1788 (no type locality [on Koelreuter]).

Stethojulis albovittata Günther: Cat. fishes Brit. Mus., vol. 4, p. 141, 1862 (Hawaiian islands).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Kandavu).—Schmeltz: op. cit., Cat. 5, p. 33, 1874 (Viti Islands).—Streets: U. S. Nat. Mus., Bull., no. 7, p. 99, 1877 (Samoa).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 256, 1881 (Hawaiian islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 273, 1883 (southeast New Guinea).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 508, 1900 (Hawaiian islands).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 21, 1902 (Honolulu).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 504, 1901 (1902) (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 459, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 528, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 284, pl. 26, 1903 (1905) (Honolulu).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, pl. 141, fig. B, 1909.—Fowler: Coepia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 241, 1928 (Samoa, Hawaii, Honolulu).

Julis balteatus Quoy and Gaimard: Voyage "Uranie," Zool., p. 267, pl. 56, fig. 1, 1824 (type loc., Maui, Hawaiian islands).—Valenciennes: Hist. nat. Poiss., vol. 13, p. 348, 1839 (Hawaiian islands).

Hinalea balteata Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 69, 1922 (Hawaii).

Stethojulis axillaris (part) Fowler: B. P. Bishop Mus., Bull. 22, p. 14, 1925 (Guam).

Head 2 7/8 to 3; depth 2 3/5 to 2 3/4; D. IX, 11, 1; A. III, 11, 1; scales 21, 4 or 5 in lateral line to caudal base and 2 more on latter; 3 or 4 scales above lateral line, 8 or 9 below, 9 predorsal; snout 2 4/5 to 2 5/6 in head; eye 5 1/4 to 5 1/3; maxillary 4 to 4 1/8; interorbital 3 2/3 to 3 3/4.

Head width 2 1/5 to 2 1/4 in its length. Snout conic, width 1 1/4 its length. Eye small, its hind edge slightly behind middle in head length. Lips rather narrow. Teeth uniform, compressed, truncate, small posterior concealed upper canine each side. Interorbital convex. Gill rakers 11+18, longest moderately lanceolate, 1/3 of gill filaments, which 1 1/5 in eye. Scales with 12 to 14 basal radiating striae, apical 11 to 16; tubes simple.

Dull brownish, paler below. Whitish line from middle of snout above, along below norstril to eye. Another from upper eye edge of occiput, then along edge of back to dorsal base to last ray. Third line from upper hind eye edge close below lateral line far as fourth scale of its course. Fourth extends from side of maxillary, close below eye till close above pectoral base, thence to caudal base medially. Fifth crosses chin, curves up over preopercle ridge, thence down to subopercle, then along gill opening edge of shoulder girdle to pectoral origin, finally parallel from axil to lower surface of caudal peduncle, all intervenig area as band of very light brown. Fins very pale.

The Academy has 2 Hawaiian specimens 112 and 123 mm. long, from J. K. Townsend. The National Museum has 1 from Maui collected by the Wilkes Expedition. Also 2 Hawaiian of which 1 from Honolulu, through the Bureau of Fisheries, and 1 from Samoa through Steinberger. In the Bishop Museum 16 from Honolulu. Largest 146 mm. Two from Guam in 1923. The Agassiz Museum has 1 from Strong Island in the Caroline Islands through Rev. B. G. Snow, 2 from Kingsmills and 5 Hawaiian, mostly through Andrew Garrett.

East Indies, Micronesia, Polynesia, Hawaii.

Stethojulis casturi (Bleeker).

Julis (*Halichoeres*) *casturi* Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 768, 1852 (type loc., Macassar).

Stethojulis casturi Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 255, 1881 (Pelew Islands, Futuma, Yap, Society Islands, Kingsmills).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 56, 1906 (Rarotonga).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, pl. 141, fig. A.—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 300, 1911 (Wotje, Marshalls).

? Julis sukl Thiollière: Fauna Woodlark, p. 195, 1857 (type loc., Woodlark Island).

Head 3 1/8; depth 3 1/5; D. IX, 11, 1; A. III, 11, 1; scales 20 in upper section of lateral line, 4 more continuous to caudal base and 2 more on latter; 2 scales above lateral line, 8 below; 7 predorsal scales; snout 3 in head; eye 6; maxillary 4 1/3; interorbital 3 4/5. Head width 2 1/3 in its length. Least depth of caudal peduncle 3 in its length. Concealed upper posterior canine each side. Gill rakers 10+19, mostly tuberculate, 3 1/2 in gill filaments, which equal eye. Scales with 29 basal radiating striae, apically 15 more or less parallel and irregular. First dorsal spine 8 1/8 in head: last spine 3 3/4; tenth dorsal ray 4 1/8; third anal spine 4 1/4; tenth anal ray 4 3/4; pectoral 1 2/5; ventral 2 1/2. Pale yellowish line from upper side of maxillary, touches eye, then back on opercular flap medianly. Another curves up from chin and then down across subopercle. Pale yellowish line from pectoral axil to median of lower caudal rays, close above broad dusky lateral band extends from postocular. Fins all pale brown. Eye slaty.

One in the Bishop Museum from Rarotonga, 118 mm. In the National Museum 1 from Wotje and 3 from Apia.

This species may be distinguished from *Stethojulis albovittata* in the blue line from the pectoral axil extending to the infero-median caudal rays, not along the lower edge of the caudal peduncle and the caudal fin. The imperfect account of *Julis sukl* may have been intended for this species. The general design of its coloration applies.

East Indies, Micronesia, Polynesia.

Stethojulis renardi (Bleeker).

Julis (*Halichoeres*) *renardi* Bleeker: Nat. Tijds. Ned. Ind., vol. 2, p. 253, 1851 (type loc., Banda, Neira).

Stethojulis renardi Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Kandavu).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 256, 1881 (Ponapé; Samoa).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 92, 1900 (Agaña, Guam).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1399, 1906 (Samoa).

Head 2 3/4; depth 3 3/5; D. IX, 11, 1; A. III, 11, 1; scales 18 in upper section of lateral line, continous with 5 more to caudal base and 2 on last; 2 scales above lateral line, 8 below; 8 predorsal scales; snout 2 2/3 in head; eye 5 3/4; maxillary 4 3/5; interorbital 4 2/5.

Body elongately ovoid, deepest at ventral origin. Least depth of caudal peduncle 3 1/4 in head. Head width 2 2/3 in its length. Snout conic, width 1 1/3 in its length. Eye with hind pupil edge midway in head length. Teeth uniserial, compressed, truncate, with even cutting-edges; no anterior canines; single strong anteriorly directed upper canine at each angle of mouth. Interorbital convex. Gill rakers 9+17, upper lanceolate, lower clavate, 2 1/2 in gill filaments, which 1 1/3 in eye. Scales with 16 basal radiating striae, 10 apical. First dorsal spine 8 2/5 in head; last dorsal spine 4 3/5; first dorsal ray 3; third anal spine 7 1/3; first anal ray 4; caudal 1 3/4; pectoral 1 2/3; ventral 2 2/3.

Brown on back, paler below, line to demarcation sharp from rictus to pectoral origin, close before which blackish, then back to median of lower caudal rays. Close above on head pale line borders, touching lower eye edge. Narrow gray band with dark margins from middle of snout above through nostrils to eye. Two dark lines across interorbital. Small dark spot on opercle flap above. Small black dot on last scale of lateral line, just above each tube. Fins and lips pale brown. Iris dull slaty.

One in the Bishop Museum from Agaña, Guam, 107 mm. long.

Zanzibar, East Indies, Riu Kiu, Queensland, Micronesia, Polynesia.

Stethojulis trilineata (Schneider).

Labrus trilineatus Schneider: Systema ichth., Bloch, p. 253, 1801 (type loc., Coringo, Coromandel). (On Seba and Koelreuter.)

Stethojulis trilineata Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 255, 1881 (Pelew Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 272, 1883 (Millport Harbor, New Guinea).

Head 3 1/5; depth 3 1/8; D. IX, 11, 1; A. III, 11, 1; tubular scales 20, 4 in lateral line to caudal base and 2 more on latter; 2 scales above, 8 below, 7 predorsal; snout 2 3/4 in head; eye 5 1/8; maxillary 4 1/2; interorbital 4 1/3.

Body compressed, elongate, ovate, deepest near pectoral tip. Caudal peduncle strongly compressed, length 4/5 its least depth, which 2 1/3 in head.

Head width 2 3/5 in its length. Snout conic, profile little convex, width 1 1/4 in snout. Eye with hind edge midway in head length; diameter 1 7/8 in snout, 1 1/4 in interorbital. Mouth small, jaws equal. Maxillary largely concealed, extends back opposite front nostril. Lips fleshy, with longitudinal folds. Teeth compressed,

rather truncate incisors, slightly graduated smaller behind; posteriorly small tooth concealed in each maxillary. Front nostril at last fourth in snout; hind nostril close before front upper eye edge. Interorbital broadly convex. Gill rakers 10+13, lanceolate, 2 in gill filaments, which 1 3/5 in eye.

Scales with 14 to 17 basal radiating striae; apical 15 or 16; circuli very fine. Scales on breast and chest not especially enlarged or not larger than those on middle of sides. Ninth dorsal spine 2 3/4 in head; seventh dorsal ray 2 2/5; third anal spine 3 1/10; fifth anal ray 2 1/3; caudal (damaged) rounded behind; pectoral 1 2/5; ventral 2 1/8.

Back olive down to level of lower pale longitudinal line, all lower surface very pale brownish. Pale line along each side of snout above to eye, then continued behind and parallel with profile of back to base of upper half of caudal; second line parallel, similarly on snout and postocular region, but not extended beyond middle of depressed pectoral; third line from chin along lower side of cheek and close below pectoral base to lower basal half of caudal; also pale median predorsal line, extending along bases of both dorsals, at least on their basal scales. Fins all pale brownish. Caudal quite pale. Iris silver-gray. Length (caudal damaged) 90 mm.

In the Agassiz Museum 1 from Ascension Island, Marshall Islands, obtained by Rev. A. A. Strong, April 14, 1877. Also 1 from Strong Island, Caroline Islands, obtained by Rev. B. G. Snow.

India, East Indies, Micronesia.

Hemigymnus fasciatus (Bloch).

Labrus fasciatus Bloch: Nat. ausländischen Fische, vol. 6, p. 6, pl. 290, 1792 (type loc., Japan).

Mullus fasciatus (non Shaw 1790) Thunberg: Voyage Japon. Lamarck, pt. 4, p. 351, pl. 3, 1796 (type loc., Japan).

Hemigymnus fasciatus Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma Island).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 587, 1822 (New Guinea).—Macleay: op. cit., vol. 8, p. 278, 1883 (southeast New Guinea).

Labrus fuliginosus Lacépède: Hist. nat. Poiss., vol. 3, pp. 437, 493, pl. 22, fig. 3, 1802 (type loc., Madagascar; Mauritius; Reunion).

Hemigymnus fuliginosus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 295, 1905 (1906) (Apia).

Tautoga mertensii Valenciennes: Hist. nat. Poiss., vol. 13, p. 225, 1839 (type loc., Carolines).

Differs from *Hemigymnus melapterus* in the presence of 5 blackish transverse bands. Reaches 260 mm.

Eight in the National Museum from Apia.

Red Sea, Zanzibar, India, Ceylon, East Indies, Japan, Micronesia, Polynesia.

Hemigymnus melapterus (Bloch).

Labrus melapterus Bloch: Nat. ausländischen Fische, pt. 5, p. 137, pl. 285, 1791 (type loc., Japan).

Hemigymnus melanopterus Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Samoa).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 253, 1881 (Pelew Islands; Samoa).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 587, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 276, 1883 (southeast New Guinea).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 36, 1885 (Rubi, New Guinea).

Hemigymnus melapterus Peters: Akad. Berlin, Monatsb., p. 843, 1876 (1877) (New Hannover).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 527, 1900 Samoa).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1398, 1906 (Upolu; Samoa).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 55, 1906 (Shortland Island).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 527, 1905 (1906) (Samoa).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 14, 35, 1925 (Guam; Samoa).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 247, 1928 (Apra Bay on Guam, Apia, Samoa).

? Julis boryii Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 141, pl. 36, 1830 (type loc., Bay of Matavai, Tahiti).

Julis beraber Thiollière: Fauna Woodlark, p. 196, 1857 (type loc., Woodlark Island).

Head 2 1/3 to 2 1/2; depth 2 1/5 to 2 1/2; D. IX, 10, 1 to 12, 1; A. III, 11, 1; scales 20 or 21, 5 or 6 in lateral line to caudal base and 2 or 3 more on latter; 6 scales above lateral line, 11 or 12 below, 13 or 14 predorsal; snout 1 7/8 to 3 7/8 in head; eye 6 7/8 to 8 1/4 (3 7/8 in young); maxillary 3 1/5 to 3 2/5 (3 4/5 in young); interorbital 3 3/4 to 4 1/5 (young 3 5/6).

Head width 2 1/3 to 2 2/5 (2 1/2 in young) in its length. Snout width 1 3/4 to 1 7/8 in its length (equal in young). Scales with 9 to 15 basal radiating striae, 4 or 5 vertical and 8 to 12 apical; 21 as short apical even lobes in adult. Young nearly warm sepia generally. Slightly oblique white band from front of spinous dorsal to trunk opposite ends of depressed ventral, its width little less than eye. Anteriorly to white band body much paler than trunk, also caudal pale. Dorsals and anals slightly darker, pectoral and ventral pale brown. In adult oblique band less distinct and pectoral and ventral quite pale. Also vermiculate line of gray-green forward from eye, below eye and on postocular. Dorsals and anals slaty brown, edged dark brown, with submarginal bluish lines. Length 41 to 250 mm.

In the Academy 2 Samoa from H. C. Caldwell and 2 from Apia. The National Museum has one without locality and another from "Hilo or Fiji," which doubtless from Fiji, obtained by the Wilkes Expedition. In the Bishop Museum 2 from Shortland Island and 1 from Guam in 1923. The Agassiz Museum has 2 from Apia and 1 from Kingsmills received from Andrew Garrett, 253 mm. long.

Julis boryii Lesson may have been intended for this species. It is, however, based on a drawing of a specimen said to be 760 mm. in length! This is a size greatly in excess of any recorded specimen of this species. Moreover, Lesson's figure shows the pectoral variegated with brown reticulations, a condition I have never seen. The figure shows:

Head 2 2/5; depth 2 7/8; D. X, 9; A. I, 11; scales 19, 7 + 1, 3 above, 10 below, 6 predorsal; snout 2 in head; eye 8 1/5; mouth cleft 3 1/3.

East Africa, Zanzibar, Mauritius, Andamans, East Indies, Japan, Queensland, Melanesia, Micronesia, Polynesia.

Halichoeres centriquadrus (Lacépède).

Labrus centriquadrus (Commerson) Lacépède: Hist. nat. Poiss., vol. 3, pp. 437, 493, 1802 (type loc., Madagascar; Mauritius; Reunion).

Halichaeres centrinquadra Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1399, 1906 (Savaii).

Halichoeres centriquadrus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, pt. 1, p. 56, 1906 (Shortland Island,

Raiatea, Tahiti).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 253, 1928 (Apia).

Labrus hortulanus Lacépède: Hist. nat., Poiss., vol. 3, pp. 449, 518, pl. 29, fig. 2, 1802 (type loc., "The Great Equatorial Ocean" [Indo-Pacific]).

Julis (Halichoeres) hortulanus Bleeker: Act. Soc. Sci. Ind. Neerl., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).

Platyglossus hortulanus Günther: Cat. fishes Brit. Mus., vol. 4, p. 147, 1862 (Aneiteum).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Viti Islands).—Schmeltz: op. cit., Cat. 5, p. 33, 1874 (Tahiti).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 587, 1882 (New Guinea).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 374, 1897 (Rotuma).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 263, 1909 (Society Islands, Samoa, Aneiteum, Shortland Island, Mortlock, Ponapé, Guam, Rotuma).

Halichoeres hortulanus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, pt. 3, p. 88, 1900 (Agaña, Guam).

Julis eximius Thiollière: Fauna Woodlark, p. 193, 1857 (Woodlark Island).

Girelle lakibile (Montrouzier) Thiollière: Fauna Woodlark, p. 193, 1857 (name in synonymy).

Distinguished by 3 or 4 rows of scales on opercle. Yellow blotch on back below third to fifth dorsal spines Size large.

In the Bishop Museum 10 from Tahiti, 1 Shortland Island, 1 Raiatea, 1 Agaña on Guam. The National Museum has 1 from Tahiti obtained by W. H. Jones, June 12 to 15, 1883. Also 4 from Apia through the Bureau of Fisheries. In the Agassiz Museum 7 from the Society Islands and 1 from the Kingsmills, all obtained by Andrew Garrett. Also 2 from Ebon Island, obtained by Rev. B. G. Snow in 1877. Largest 278 mm.

Red Sea, Zanzibar, Madagascar, Mauritius, India, Ceylon, Andamans, East Indies, China, Melanesia, Micronesia, Polynesia.

Halichoeres notophthalmus (Bleeker).

Tautoga notophthalmus Bleeker: Soc. Sci. Ind. Neerl., Act. (Manado), vol. 1, p. 53, 1856 (type loc., Manado, Celebes).

Hemitautoga notophthalmus Bleeker: Atlas Ichth. Ind. Néerl., vol. 1, p. 140, pl. 21, fig. 1, 1862 (New Guinea).

Halichoeres notophthalmus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 301, 1905 (1906) (Apia).

Head 2 4/5; depth 3; D. IX, 11, 1; A. II, 11, 1; scales 22 in upper section of lateral line, continuous with 4 in lower section to caudal base and 2 more on latter; 4 scales above lateral line, 9 below; 9 predorsal scales; snout 3 1/5 in head measured from upper jaw tip; eye 4 1/6; maxillary 4 1/2; interorbital 4 1/4.

Body fusiform or but slightly ovoid, deepest about end of ventral. Least depth of caudal peduncle 2 1/6 in head. Head width 2 3/5 in its length. Snout conic, width 1 1/3 in its length. Eye with hind edge nearly midway in head length. Teeth uniserial, conic; 4 canines in front of each jaw, with outer upper one each side curved back. Interorbital convex. Gill rakers 11+14, slender, lanceolate, about 2/5 of gill filaments, which 2 1/3 in eye. Scales with 23 basal radiating striae and 14 apical. First dorsal spine 3 2/3 in head; first branched dorsal ray 1 3/5; second anal spine 3; first branched anal ray 2 3/4; caudal 1 1/3; pectoral 1 3/5; ventral 2 1/4.

Pale brown. Dusky-brown blotch begins at ninth scale of lateral line and extends to its deflection, also upon hind part of spinous dorsal and front of soft dorsal, where large black white edged ocellus. Most scales below lateral line and on side of caudal peduncle with dusky-brown basal bar. Small black spot at base of last dorsal ray and near origin of upper caudal lobe on caudal base, also another at pectoral base. Occiput and front of predorsal deep brown. Brown band from snout tip through eye to opercle flap, where ending in dark spot. Short deep brown bar close behind eye. Another brown band from side of mandible to opercle below. Brown spot at symphysis. Brown spot at front of interorbital each side of median line. Soft dorsal with few brown blotches. Length 72 mm.

One from Agaña, on Guam, in the Bishop Museum, as "malavpo." Two in the National Museum from Apia.

East Indies, Polynesia.

Halichoeres scapularis (Bennett).

Julis scapularis Bennett: Zool. Soc. London, Proc. Comm., vol. 1, p. 167, 1831 (type loc., Mauritius).

Platyglossus (Güntheria) scapularis Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).

Platyglossus scapularis Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 131, 1913 (Saonek, Waigiu).

Halichoeres scapularis Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 56, 1906 (Shortland Island).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 300, 1905 (1906) (Pago Pago; Apia).

Head 3 1/5; depth 3 1/3; D. IX, 11, 1; A. III, 11, 1; scales 21 in upper section of lateral line, continuous with 5 in lower section to caudal base and 2 more on latter; 4 scales above lateral line, 8 below; 8 predorsal scales; snout 2 3/5 in head from snout tip; eye 5 1/4; maxillary 3 3/4; interorbital 4 4/5. Least depth of caudal peduncle 2 1/8 in total head length. Head width 2 2/3 in its length. First dorsal spine 4 in head; tenth dorsal ray 2 3/4; third anal spine 4; tenth anal ray 3 1/8; caudal 1 2/5; pectoral 1 3/4; ventral 1 7/8. Length 126 to 161 mm.

In the Bishop Museum 3 from Shortland Island.

This species somewhat resembles *Halichoeres centriquadrus* in its barred caudal, though differs in fewer dark blotches on the side of the head, absence of pale blotch below spinous dorsal and in the presence of a diffuse median lateral dark band.

Red Sea, Mozambique, Natal, Mauritius, India, Ceylon, Andamans, East Indies, Philippines, Queensland, Melanesia, Polynesia.

Halichoeres trimaculatus (Quoy and Gaimard).

Julis trimaculata Quoy and Gaimard: Voyage "Astrolabe," Zool., vol. 3, p. 705, pl. 20, fig. 2, 1834 (type loc., Vanikoro).

Julis trimaculatus Valenciennes: Hist. nat. Poiss., vol. 13, p. 331, 1839 (Vanicolo).

Platyglossus trimaculatus Günther: Cat. fishes Brit. Mus. vol. 4, p. 153, 1862 (Vanicolo or East Indies?).—Günther: Cruise of "Curacoa" (Brenchley), p. 410, 1873 (Solomons).—Günther: Rept. voyage "Challenger," vol. 1, p. 36, 1880 (Levuka, Fiji).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 374, 1897 (Rotuma Island).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 266, 1909 (Samoa, Fiji, Solomons, Ellice Islands, Vanicolo, Pelew Islands).

Platyglossus (Halichoeres) trimaculatus Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Viti Islands; Samoa).

Platyglossus crimaculatus Steindachner: Akad. Wiss. Wien, Sitz., vol. 102, pt. 1, p. 238, 1893 (New Hebrides).

Halichaeres trimaculatus Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1399, 1906 (Upolu).

Halichoeres trimaculatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 56, 1906 (Tahiti, Tubuai, Shortland Island, Faté).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 301, pl. 47, fig. 1, 1905 (1906) (Apia; Pago Pago).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 300, 1911 (Makemo and Fakarava, Paumotus).—McCulloch: Australian Mus., Records, vol. 9, p. 385, 1913 (Hood Bay, New Guinea; Samoa).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 15, 35, 1925 (Guam; Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 22, 1925 (Wake Island).—Fowler: op. cit., Bull. 38, p. 24, 1927 (Tongareva).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 258, 1928 (Apia, Makemo).

Julis (*Halichoeres*) *spilurus* Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).

Halichoeres modestus (non Bleeker) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 56, 1906 (Faté).

Head 2 2/3 to 2 4/5; depth 3 1/2 to 3 3/4; D. VIII or IX, 11, 1; A. III, 11, 1; scales 21 or 22, 4 in lateral line to caudal base and 2 more on latter; 3 scales above lateral line, 8 below, 5 to 7 predorsal; snout 3 to 3 1/2 in head; eye 3 1/2 to 4 1/4; maxillary 3 7/8 to 4; interorbital 4 2/5 to 5 2/5.

Head width 2 3/4 in its length. Snout conic, width 1 3/5 in its length. Hind eye edge slightly behind middle in head length. Canines 2/2, and short concealed canine each side above. Interorbital convex. Gill rakers 5+12, short lanceolate points, 1/3 or less than gill filaments, which 1/2 of eye. Scales with 23 or 24 basal radiating striae, apical 12 to 18. Dull brownish above, whitish below. Five pale vertical bars from lower whitish color extend upward to body edge and divided color of back into 5 quadrate blotches, within which edge of each scale deep brown to gray. At caudal base above blackish blotch little smaller than eye, which may be followed by 1 or 2 black dots on caudal base medially. Bluish streak on side of snout and below eye, usually with some bluish spots above. Small black spot at pectoral origin, otherwise fins all pale brown. Length 33 to 72 mm.

In the Academy 12 from Apia. The National Museum has 1 from Fiji and 1 Fiji or Samoa?, obtained by the Wilkes Expedition. Others are 16 from Apia from the Bureau of Fisheries and 2 Makemo. The Agassiz Museum has 11 from Apia, 2 Fakarava; 5 Society Islands and 4 Kingsmills, both through Andrew Garrett; 8 Ascension Island and 4 Ebon Island, 3 Strong Island, all from Rev. B. G. Snow in 1877; largest 164 mm. The Bishop Museum has 1 from Tahiti, 6 Faté, 1 Tubuai, 3 Shortland Island and 1 Agaña on Guam. Largest 179 mm. Also 2 from Wake Island and 5 from Guam in 1923.

East Indies, Philippines, Japan, Micronesia, Melanesia, Polynesia.

Halichoeres vicinus (Günther).

Platyglossus vicinus Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 267, pl. 142, fig. C, 1909 (type loc., Kingsmills).—Fowler: B. P. Bishop Mus., Bull. 22, p. 15, 1925 (Guam).

Head 2 3/4; depth 3 1/8; D. IX, 11, 1; A. II, 11, 1; scales 21, 4+2 in lateral line, 2 above to soft dorsal origin, 8 below, 8 predorsal; snout 2 1/3 in head; eye 5 3/4; mouth cleft 4; interorbital 5 3/5.

Body well compressed, elongately ovoid, predorsal with slight keel. Head width 2 2/3 its length. Snout conic, width 1 1/2 its length. Eye high, center midway in head length, 2 1/5 in snout, equals interorbital. Mouth small, jaws equal. Lips broad, cover most of teeth, upper with longitudinal folds inside. Teeth conic, uniserial, pair of canines anteriorly in each jaw project forward. Nostrils small, separate; front one at last fifth in snout; hind one little higher and little nearer front one than eye. Interorbital convex. Preopercle edge entire. Opercle with few weak striae anteriorly. Gill rakers 5+12, lanceolate, little less than half of gill filaments, which 1 1/3 in eye. Scales with 38 to 41 basal radiating striae, 27 to 32 apically. Lateral line complete, tubes slender, simple and well exposed. Fourth dorsal spine 4 in head, first ray 3 1/8; second anal spine 5 3/4, third ray 3 1/2; caudal 1 1/2, rounded behind; least depth of caudal peduncle 2 1/5; pectoral 1 1/2; ventral 1 2/5.

When fresh pale olive-gray generally, inclining whitish below. Head with ground-color blue on upper half, lower half paler. Two pink bands from snout to eye, lower continued along lower side and broken behind, down towards pectoral origin. Several pink postocular blotches, also several pink blotches on lower side of head. Head above, predorsal and front portion of back about front of spinous dorsal dusky-slate. Each scale with blue blotch and pink band from pectoral axil down across belly just behind ventral bases. All scales on trunk with obscure pale vertical streak. Large black blotch, larger than eye on caudal peduncle above lateral line. Dorsals largely greenish, with 3 longitudinal buff lines, uppermost becoming submarginal at soft dorsal, edge of which grayish. Anal with dark gray submarginal line, then broad gray band, white median line, dark gray line, band of green, another dark gray line, subbasal pink band and base norrowly greenish. Caudal yellowish. Paired fins pale brownish, little lighter basally. Length 132 mm.

In the Bishop Museum 1 from Guam in 1923.

Halichoeres kallochroma (Bleeker).

Julis (*Halichoeres*) *kallochroma* Bleeker: Nat. Tijds. Ned. Ind., vol. 4, p. 289, 1853 (type loc., Priaman, Sumatra).

Platyglossus kallochroma Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Samoa).

Halichoeres kallochroma Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 261, 1928 (type of *Platyglossus flos-corallis*).

Platyglossus flos-corallis Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 299, pl. 46, fig. 2, 1905 (1906) (type loc., Pago Pago, Samoa).

Head 3 2/5; depth 3 1/3; D. VIII, 13, 1; A. III, 11, 1; tubular scales 20, 4 in lateral line to caudal base and 2 more on latter; 3 scales above, 10 below, 7 predorsal; snout 3 1/5 in head; eye 4 4/5; maxillary 4 7/8; interorbital 4 2/5.

Body elongate, fusiform, compressed, predorsal slightly trenchant. Caudal peduncle well compressed, length 3/4 its least depth, which 2 in head.

Head width 2 2/5 in its length. Snout conic, width 1 3/5 in its length. Eye with hind edge slightly behind middle in head length; diameter 1 3/5 in snout, 1 1/6 in interorbital. Mouth small, jaws even. Maxillary concealed, reaches back about opposite front nostril. Lips moderate, entire, with longitudinal folds. Teeth conic, uniserial, graduated smaller behind; no posterior canines. Front nostril at last fifth in snout; hind nostril opposite front eye edge. Interorbital convex. Gill rakers 5+13, lanceolate, 2 1/2 in gill filaments.

Scales with 27 or 28 basal radiating striae; apical 20 or 21; circuli fine. Lateral line continuous, tubes trifurcate. Eighth dorsal spine 3 in head; eighth dorsal ray 2 2/5; second anal spine 3 1/5; third anal ray 2 1/5; caudal 1 1/4, hind edge slightly concave; pectoral 1 1/3; ventral 2 1/8.

Pale brown generally, paler below. Traces of many dark longitudinal bands, 2 from behind eye and 1 on cheek. Iris gray-brown. Dorsals with 2 median longitudinal brown lines, dusky-brown blotch on second spine medianly and adjacent portions of membranes. Anal with brown subbasal line. Dark spot at pectoral origin. Length 95 mm.

In the Agassiz Museum 1 from the Society Islands, obtained by Andrew Garrett. It differs from Bleeker's figure in that the pectoral base is without a dark crossband. Bleeker does not show a dark blotch at the front of the spinous dorsal. Type of *Platyglossus flos-corallis* from Apia, Samoa, in the National Museum.

East Indies, Polynesia.

Halichoeres melanurus (Bleeker).

Julis (*Halichoeres*) *melanurus* Bleeker: Nat. Tijds. Ned. Ind., vol. 2, p. 251, 1851 (type loc., Banda, Neira) —Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).

Platyglossus (*Guntheria*) *melanurus* Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).

Platyglossus melanurus Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 274, 1883 (South Cape, New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 265, 1909 (Ponapé).

Differs from *Halichoeres kallochroma* in the presence of 7 transverse pale yellowish bars on the back.

East Indies, Micronesia.

Halichoeres marginatus Rüppell.

Halichoeres marginatus Rüppell: Neue Wirbelth. Fische, p. 16, 1835 (type loc., Mohila; Massaua, Red Sea).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 265, 1928 (Apia).

Platyglossus marginatus Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Samoa).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 56, 1906 (Raiatea, Society Islands).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 299, pl. 46, fig. 1, 1905 (1906) (Apia).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 271, pl. 143, fig. C, 1909 (Society Islands; Samoa).

A handsome species, greatly like *Halichoeres notopsis*, but without black ocellus at front of soft dorsal. Vertical fins and tail all finely dotted or speckled with blue.

In the Bishop Museum 1 from Raiatea and 1 from Nukuhiva. Length 130 and 135 mm. Both agree with Bleeker's figure in having a gray caudal margin, separate from the submarginal white line. One in the National Museum from Apia. Two in the Agassiz Museum obtained by Andrew Garrett in the Society Islands. Length 139 mm.

Red Sea, Mauritius, India, Ceylon, Andamans, East Indies, Polynesia.

Halichoeres notopsis (Valenciennes).

Julis notopsis (Kuhl and Van Hasselt) Valenciennes: Hist. nat. Poiss., vol. 13, p. 355, 1839 (type loc., Guam).

Platyglossus notopsis Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Samoa).—Günther: Zool. Soc. London, Proc., p. 667, 1871 (Savay).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 374, 1897 (Rotuma).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 299, 1905 (1906) (Apia; Pago Pago).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 268, pl. 142, fig. A, 1909 (Society Islands).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 130, 1913 (Saonek, Waigiu).—Fowler and Silvester: Carnegie Inst., Marine Papers, p. 122, 1922 (Pago Pago).

Halichoeres notopsis Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 267, 1928 (Apia, Pago Pago).

Head 2 2/3 to 3 1/4; depth 2 1/2 to 3 1/8; D. IX, 13, 1; A. III, 12, 1; tubular scales 22, 3 in lateral line to caudal base and 2 more on later; 4 scales above, 8 to 10 below, 10 to 13 predorsal; snout 3 1/8 to 3 1/5 in head; eye 3 2/5 to 4 1/4; maxillary 3 1/5 to 4 3/4; interorbital 4 to 4 1/3.

Body oblong, ovate, well compressed, deepest about midway in spinous dorsal, predorsal slightly trenchant. Caudal peduncle strongly compressed, length 3/5 its least depth, which 1 4/5 in head.

Head width 2 1/4 to 2 2/3 in its length. Snout conic, width 1 1/3 to 1 2/5 in its length. Eye with hind edge midway in head length; diameter 1 1/2 in snout, 1 1/6 in interorbital. Mouth small, jaws even. Maxillary concealed, reaches half way in snout. Lips moderate, with longitudinal folds, especially upper. Teeth conic, graduated smaller backward; each side posteriorly above detached small canine, directed horizontally forward. Front nostril at last fifth in snout; hind nostril close before and above front eye edge. Interorbital convex. Gill rakers 5 to 7 + 10, short weak points, 2 to 3 in gill filaments, which 2 in eye.

Scales with 19 to 31 basal radiating striae; apical 12 to 26; circuli fine. Scales on predorsal and chest smaller and crowded. Ninth dorsal spine 2 1/3 in head; fifth dorsal ray 1 3/4; third anal spine 3 2/3; third anal ray 2 1/4; caudal 1 1/4, rounded behind; pectoral 1 1/3; ventral 1 3/5.

Body uniform brownish. Vertical fins all darker, with black white-edged ocellus at origin of spinous dorsal and 1 on membranes of second, third and fourth rays of soft dorsal. Paired fins brown. Length 95 mm.

In the Agassiz Museum 1 from the Society Islands, obtained by Andrew Garrett. Also 1 from the Kingsmills by the same and 3 from Apia. In the National Museum 8 from Apia. The Academy has 4 from Apia and 3 from Pago Pago. Compared with Günther's figure they show the head, dorsals, and anals much darker, not so contrasted and the pale horizontal lines not so fine but more contrasted. In the young or smaller specimens the tail is white and the longitudinal bands white.

India, East Indies, Philippines, Queensland, Micronesia, Polynesia.

Halichoeres hoevenii (Bleeker).

Julis (*Halichoeres*) *hoevenii* Bleeker: Nat. Tijds Ned. Ind., vol. 2, p. 240, 1851 (type loc., Banda, Neira).

Platyglossus hoevenii Schmeltz: Mus. Godeffroy, Cat. 6, p. 16, 1877 (Pelew Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 273, 1883 (Hood Bay, New Guinea).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 300, 1905 (1906) (Pago Pago).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 268, 1909 (Pelew Islands; Mortlock).

Halichoeres hoevenii Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 268, 1928 (Apia).

Like *Halichoeres kallochroma* but with small black ocellus at front of spinous dorsal, larger one at front of soft dorsal and third small one at upper base of caudal.

One from Apia in the National Museum.

East Indies, Micronesia, Polynesia.

Halichoeres miniatus (Valenciennes).

Julis miniatus (Kuhl and Van Hasselt) Valenciennes: Hist. nat. Poiss., vol. 13, p. 337, 1839 (type loc., Java).

Platyglossus miniatus Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Viti Islands).

Differs from *Halichoeres pseudominiatus* in that the anal is pale, dotted dark and pocket of each abdominal scale whitish.

East Indies, Philippines, China, Polynesia.

Halichoeres margaritaceus (Valenciennes).

Julis margaritaceus Valenciennes: Hist. nat. Poiss., vol. 13, p. 354, 1839 (type loc., Vanicolo).

Halichoeres margaritaceus Fowler: B. P. Bishop Mus., Bull. 38, p. 24, 1927 (Christmas and Howland islands).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 271, 1928 (Apia).

Julis (Halichoeres) pseudominiatus Bleeker: Soc. Sci. Ind. Neerl., Act. (Amboina), vol. 1, p. 62, 1856 (type loc., Amboina; Manado; Timor Kupang; Priaman).

Platyglossus (Halichoeres) pseudominiatus Schmeltz: Mus. Godeffroy Cat. 4, p. 22, 1869 (Samoa).

Platyglossus opercularis Günther: Cat. fishes Brit. Mus., vol. 4, p. 148, 1862 (type loc., Fiji; Amboina).—Günther: Cruise of "Curaçoa" (Brenchley), p. 410, 1873 (Solomons).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 16, 1877 (Samoa).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 374, 1897 (Rotuma Island).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 264, 1909 (Pelew Islands, Solomons, Samoa, Fiji, Guam, Rotuma, Ruk).

Halichoeres opercularis Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 89, 1900 (Guam).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 302, pl. 47, fig. 3, 1905 (1906) (Apia; Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 15, 35, 1925 (Guam; Samoa).

Head 2 2/3 to 3; depth 3 1/8 to 3 2/3; D. IX, 11, 1; A. III, 11, 1; scales 22 in upper section of lateral line, continuous with 4 in lower section to caudal base and 2 more on latter; 3 scales above lateral line, 8 below; 7 predorsal scales; snout 3 1/3 to 3 1/2 in head; eye 3 1/3 to 4 1/4; maxillary 4 1/8 to 4 2/3; interorbital 4 2/3 to 4 3/4.

Head width 2 1/3 to 2 2/5 in its length. Snout conic, width 1 1/6 to 1 1/4 its length. Eye rather large, hind edge little before middle in total head length. Pair of canines in front of each jaw and hind concealed small canine each side. Interorbital broadly convex. Gill rakers 7 + 10, short firm points, about 1/3 in gill filaments, which half of eye. Scales with 18 to 20 basal striae, apical 15 to 20. Dull brown. Large dusky-brown blotch on middle of side, sometimes double, often another at caudal base. Most scales on back with obscure longitudinal dusky streaks. Small dusky spot often at snout tip and another little larger always close behind eye. Often dusky or blackish occipital spot. Brown band from side of snout close along eye edge across opercle. Brown blotch on opercular flap. Black blotch terminally on front of soft dorsal and smaller one at front of spinous dorsal, also usually terminal. Dorsals with oblique brown waved streaks, transverse or vertical on caudal, which often dusky terminally. Length 38 to 70 mm.

In the Academy 15 from Apia. Sixteen in the National Museum from Apia. The Bishop Museum has 2 from Guam. Also 1 from Guam in 1923. In the Agassiz Museum 9 from Strong Island in the Carolines and 15 from Apia.

Though incompletely described *Julis margaritaceus* Valenciennes is surely very close to this species and so far as the account goes agrees. Condensed it is as follows: D. IX, 11; A. III, 11. Distinguished by mother-of-pearl tints, disposed in more or less interrupted bands on belly. Nacre tint below eye, posterior to eye 2 black spots. Along side mingling of black, forming 4 or 5 transverse bands. Also on back some pearly as spots, 2 or 3 more or less prominent. Length 51 mm. This surely agrees with the excellent figure given by Günther of his *Platyglossus opercularis* (Fishes of Zanzibar, p. 95, pl. 12, fig. 1, 1866). A still later synonym, *Julis (Halichoeres) pseudominiatus* of Bleeker is not different.

East Africa, East Indies, Philippines, China, Melanesia, Micronesia, Polynesia.

Halichoeres nebulosus (Valenciennes).

Julis nebulosus Valenciennes: Hist. nat. Poiss., vol. 13, p. 337, 1839 (type loc., Bombay).

Halichoeres nebulosus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 88, 1900 (Guam).—Fowler: B. P. Bishop Mus., Bull. 22, p. 35, 1925 (Samoa).—Fowler: B. P. Bishop Mus., Bull. 38, p. 24, 1927 (Christmas Island).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 273, 1928 (Apia).

Platyglossus nebulosus Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 265, 1909 (Ponapé).

Julis poecila (Richardson) Lay and Bennett: Zool. Beechey's voyage, p. 66, pl. 19, fig. 1, 1839 (type loc., "Loo Choo" [Riu Kiu]).

Platyglossus poecilus Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Viti Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 273, 1883 (Engineer Group, New Guinea).

Halichoeres daedalma Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 301, pl. 47, fig. 2, 1905 (1906) (type loc., Apia; Pago Pago).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 614, 1908 (Suva, Fiji).

Halichoeres notophthalmus (non Bleeker) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 56, 1906 (Rarotonga).

Head 2 7/8 to 3; depth 3 1/8 to 3 2/5; D. VIII or IX, 11, 1; A. III, 11, 1; scales 22 in upper section of lateral line, continuous with 4 or 5 more to caudal base and 2 more on latter; 3 or 4 scales above lateral line, 9 below; 8 predorsal scales; snout 3 1/4 to 3 2/5 in head; eye 4 1/3 to 5; maxillary 4 1/8 to 4 1/6; interorbital 4 2/5 to 5.

Head width 2 1/3 in its length. Snout conic, length 1 1/2 in its width. Hind eye edge midway in head. Teeth with pair of strong canines in front of each jaw and posterior canine concealed each side above. Interorbital convex. Gill rakers 6 + 13, lanceolate, short, 1/3 of gill filaments, which 1 3/5 in eye. Scales with 18 to 22 basal radiating striae, apical 20 to 23. Brown above, white below. Blue band from snout tip to eye, one from side of maxillary to lower eye edge, curving down on opercle and then forward along edges of branchiostegals. Within loup horizontal band across cheek from rictus. Slaty-dusky blotch behind eye and larger one on opercle flap. Three large dusky-brown blotches on side, one at shoulder and one at caudal much smaller. Fins pale, with black spot at front of spinous dorsal and another at front of soft dorsal, larger. Soft dorsal with oblique brown streaks. Traces of 4 or 5 vertical obscure dark streaks. Spinous dorsal with row

of pale basal blotches. Caudal pale, with scattered vertical pale spots. Anal pale gray, with longitudinal pale median band, row of pale spots basally. Pectoral and ventral pale. Length 73 to 90 mm.

Three in the Academy from Apia. In the National Museum 1 specimen 102 mm. from Samoa obtained by S. G. Whitmee and types of *Halichoeres daedalma,* from Samoa. The Bishop Museum has 3 from Guam and 1 from Rarotonga. The Agassiz Museum has 2 Strong Island from Rev. B. G. Snow, 3 Apia, 4 Society Islands and 9 Kingsmills, both of last two localities through Andrew Garrett. *Julis poecila* Lay and Bennett, *Julis (Halichoeres) harloffi* Bleeker and *Halichoeres daedalma* Jordan and Seale are synonyms. The colored figure of the last agrees in most all respects better with Bleeker's figure of *Halichoeres poecila,* though Jordan and Seale claim as a distinction for *Halichoeres daedalma* "the markings are different, notably, those on the cheek which form a straight stripe, not a ring or horse-shoe." It was this ring which led me to propose *Halichoeres annulatus* on Sumatran specimens, which is not otherwise distinct and must therefore be merged in the synonymy.

Red Sea, India, East Indies, Philippines, Riu Kiu, Queensland, Micronesia, Polynesia.

Halichoeres solorensis (Bleeker).

Julis (Halichoeres) solorensis Bleeker: Nat. Tijds. Ned. Ind., vol. 5, p. 86, 1853 (type loc., Lawajong, Solor).

Halichoeres solorensis Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 56, 1906 (Nukuhiva, Marquesas).

Head 2 7/8; depth 3 1/2; D. IX, 11, 1; A. III, 11, 1; scales 21 in upper section of lateral line, continuous with 3 in lower section to caudal base and 2 on latter; 4 scales above lateral line, 9 below; 9 predorsal scales; snout 3 in head measured from upper jaw tip; eye 4 1/2; maxillary 4 1/5; interorbital 4 1/2. Least depth of caudal peduncle 2 1/2 in total head length. Head width 2 1/2 in its length. First dorsal spine 4 4/5 in head; last spine 2 4/5; tenth dorsal ray 3; third anal spine 3 4/5; tenth anal ray 3; caudal 1 2/5; pectoral 1 3/5; ventral 2. Length 76 mm.

In the Bishop Museum 2 from Nukuhiva.

This species is known by the more uniform appearance of its body, black ocellus at front of spinous dorsal, one at soft dorsal front and another at caudal base above. Red line from snout to eye and 2 postocular, also another on lower side of head.

East Indies, Polynesia.

Halichoeres papilionaceus (Valenciennes).

Julis papilionaceus Valenciennes: Hist. nat. Poiss., vol. 13, p. 355, 1839 (type loc., Vanicolo).

Platyglossus schwarzi Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 130, 1913 (Saonek, Waigiu).

D. IX, 11; A. III, 11. Body striped and spotted more or less obscurely with blue. Head with blue streak on suborbital between mouth and eye, another low on preopercle. Vertical band descends along hind edge of preopercle and extends on opercle, some small blue spots above and below. Large blue spot at third and fourth dorsal spines, which marked with more or less obscure lilac ocelli. Anal speckled like dorsal, but without black dots. Caudal truncate, black at middle of hind border. Length 77 mm. (Valenciennes)

A very handsome species, readily known by the large black blotch at the anteromedian portion of the spinous dorsal. Doubtless *Julis (Halichoeres) schwarzii* Bleeker (Bataviaasch Genoot. Verh., [Bali] vol. 22, p. 7, 1849, type loc., Boleling, Bali; Sumanap, Madura) is the same, figured by him later as *Halichoeres schwarzii* (Atlas ichth. Ind. Neerl., vol. 1, p. 117, pl. 39, fig. 3, 1862).

East Indies, Philippines, Melanesia.

Halichoeres macleayi (Jordan and Seale).

Halichoeres macleayi Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 303, 1905 (1906) (on Macleay).

Platyglossus margaritaceus (non Valenciennes) Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 274, 1883 (Hood Bay, New Guinea).

Depth rather more than 4 in total; D. VII, 11; A. II, 11; scales 25 in lateral line; snout pointed; eyes small; teeth prominent; tail truncate. In spirits yellowish, darker on top of head, with broad pearly stripe more or less edged black extending from opercle to or nearly to tail; apparently large oval pearly spot on opercle. Fins yellow, with black spot on first dorsal spine, last anal ray and on middle of uppermost and lowest caudal rays. (Macleay)

Only known from Macleay's description, which greatly suggests *Halichoeres bicolor* (Schneider), with which it may be found synonymous, only the spots on the fins said to be different.

Halichoeres bicolor (Schneider).

Labrus bicolor Schneider: Syst. Icth. Bloch, p. 267, 1801 (no type locality) (on Seba: Thesas., vol. 3, p. 96, no. 8, pl. 31, fig. 8, 1758).

Platyglossus bicolor Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 130, 1913 (Majalibit Bay, Waigiu).

Dark median lateral band, with pearl spot on each scale, extends on trunk and tail. Short dark bar behind eye. Black blotch on last dorsal spines basally.

East Indies.

Halichoeres leparensis (Bleeker).

Julis (Halichoeres) leparensis Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 730, 1852 (type loc., Lepar Island).

Halichoeres leparensis Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 89, 1900 (Guam).

Platyglossus leparensis Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 268, 1909 (on Seale).

Head 3 1/8; depth 4 1/4; D. IX, 12; A. II, 11; scales 22 in upper section of lateral line, continuous with 4 in lower section to caudal base and 2 more on latter; 3 scales above lateral line, 8 below; 7 predorsal scales; snout 3 2/3 in head measured from upper jaw tip; eye 3 7/8; maxillary 4 1/2; interorbital 4 1/5.

Body elongately fusiform, well compressed. Least depth of caudal peduncle 2 in total head length. Head width 2 2/5 in its length. Snout conic, long as wide. Eye with hind edge midway in head length. Teeth uniserial, conic; 4 canines, slightly enlarged, in front of each jaw, outer not especially recurved. Interorbital broadly convex. Gill rakers 9 + 13, short, 1/4 of gill filaments, which 2 in eye. Scales with 24 basal striae, 13 apical, all radiating marginally. First dorsal spine 4 3/5 in head; last spine 3; first dorsal ray 2 1/2; second anal spine 3 1/4; first anal ray 3; caudal 1 1/3;

pectoral 1 3/5; ventral 2. Pale uniform brown. Dusky-brown spot at front of spinous dorsal, one at soft dorsal origin, another at base of last dorsal ray and one at base of caudal on median rays. Snout end brownish. Iris pale slaty.

One from Guam, 33 mm. long in the Bishop Museum. A handsome small species with at least 4 or 5 parallel postocular horizontal lines.

India, East Indies, Philippines, Micronesia.

Halichoeres binotopsis (Bleeker).

Julis (Halichoeres) binotopsis Bleeker: Bataviaasch Genoot., Verh. (Bali), vol. 22, p. 7, 1849 (type loc., Boleling, North Bali).

Platyglossus binotopsis Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Kandavu; Pelew Islands).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 131, 1913 (Saonek, Waigiu).

Like *Halichoeres leparensis* but with only 2 rosy postocular bands horizontally. Dark bar at pectoral base.

East Indies, Micronesia, Polynesia.

Halichoeres hyrtlii (Bleeker).

Julis (Halichoeres) hyrtlii Bleeker: Soc. Sci. Ind. Neerl., Act. (Manado), vol. 1, p. 60, 1856 (type loc., Macassar).

Platyglossus hyrtli Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 131, 1913 (Majalibit Bay, Waigiu).

Known by its dark median lateral band and dark band along each side of back or dorsal bases. Small black caudal spot basally. Dorsals with dark reticulations and black ocellus at front of fin. Black spot at pectoral origin.

Halichoeres hyrtlii (Bleeker) has not been found in Oceania. Regan lists it from Christmas Island, Indian Ocean, as *Platyglossus hyrtelii* in Proc. Zool. Soc. London, pt. 1, p. 404, 1909.

Persian Gulf, East Indies, Philippines, China.

Halichoeres ornatissimus (Garrett) (Pl. XXXVII, *C*).

Julis ornatissimus Garrett: California Acad. Sci., Proc., vol. 3, p. 63, 1863 (type loc., Hawaiian islands).

Halichoeres ornatissimus Snyder: U. S. Fish Comm., Bull., vol. 22, p. 528, 1902 (1904) (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 22, 1925 (Pearl and Hermes Reef, Johnston Island).

Halichoeres iridescens Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 47, fig. 2, 1899 (1900) (type loc., Honolulu).—Jenkins: op. cit., vol. 22, p. 460, 1902 (1903) (Honolulu).

Hemicoris iridescens Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 20, 1902 (Honolulu).

Halichoeres lao Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 48, fig. 2, 1899 (1900) (type loc., Honolulu).—Jenkins: op. cit., vol. 22, p. 460, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 285, fig. 122, 1903 (1905) (Honolulu).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).

Somewhat resembles *Halichoeres binotopsis* but without dark bar at pectoral base. Apparently the dorsals variably with small black front ocellus, another at front of soft dorsal and third at last rays.

The Bishop Museum has 8 from Honolulu and 1 from Diamond Head in June 1922, received from Mrs. Arthur Smith. I also found a few in a rock pool at Diamond Head on December 8, 1922 and a few at Pearl City on November 12, 1922. One from Pearl and Hermes Reef and 2 from Johnston Island in 1923. The National Museum has 2 from Oahu obtained by the Wilkes Expedition. The Agassiz Museum has 2 adults from Honolulu obtained by W. H. Jones. The Academy has a specimen 38 mm. long from Refuge City, Honauman Bay, Hawaii, collected by H. A. Pilsbry. It shows the side with 3 rows of rather large dark blotches and 6 in each row, pectoral axil with small dusky dot and blackish blotch on first and last membranes of spinous dorsal.

Halichoeres timorensis (Bleeker).

Julis (Halichoeres) timorensis Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 171, 1852 (type loc., Timor Kupang).

Platyglossus timorensis Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Viti Islands).

Platyglossus trilineatus Peters: Akad. Wiss. Berlin, Monatsb., p. 843, 1876 (1877) (New Hannover).

Side with irregular rosy short bars more or less horizontal and some black spots. Rosy line from rictus to eye and across opercle. Black ocellus at front of dorsal and another at bases of upper caudal rays. Length 68 mm. (Bleeker)

East Indies, Melanesia, Polynesia.

Halichoeres kawarin (Bleeker).

Julis (Halichoeres) kawarin Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 172, 1852 (type loc., Timor Kupang).

Platyglossus kawarin Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 266, pl. 142, fig. 13, 1909 (Society and Kingsmill Islands).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 131 (Saonek, Waigiu).

Distinguished by the several ring like or diamond like lateral marks of rosy. Small dark ocellus at front of soft dorsal.

One in the National Museum from Samoa obtained by Steinberger, 60 mm. long. It agrees with *Halichoeres kawarin* as figured by Bleeker (Atlas ichth., vol. 1, p. 121, pl. 41, fig. 4, 1862).

East Indies, Micronesia, Polynesia.

Halichoeres prosopeion (Bleeker).

Julis prosopeion Bleeker: Nat. Tijds. Ned. Ind., vol. 5, p. 347, 1853 (type loc., Amboina).

Julis (Halichoeres) prosopeion Bleeker: Act. Soc. Sci. Ind. Neerl., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).

Head and thorax purplish, rest of body yellowish. Diffuse dusky blotch at front of spinous dorsal. Blue longitudinal lines on dorsals and anals. Length 135 mm. (Bleeker)

East Indies.

Halichoeres argus (Schneider).

Labrus argus Schneider: Systema ichth., Bloch, p. 263, 1801 (type loc., Australia) (?Walbaum, Artedi, Piscium, 2nd ed., pt. 3, p. 261, 1792, no type locality?).

Labrus guttatus (non Bonnaterre 1788) Bloch: Nat. ausländischen Fische, vol. 5, p. 149, pl. 287, fig. 2, 1791 (type locality unknown).

Platyglossus guttatus Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Vitti Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 274, 1883 (New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 270, 1909 (Ovalau).

Platyglossus guttulatus Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 587, 1882 (type loc., New Guinea).

A very handsome species and though larger greatly resembles *Halichoeres leparensis*. Always distinguishable by the rosy oblique line on the cheek sloping up from behind rictus to eye.

One in the National Museum without locality, likely somewhere in Polynesia?, obtained by the Wilkes Expedition.

There is little doubt but what *Platyglossus guttulatus* Macleay is a synonym.

East Indies, Philippines, Polynesia.

Halichoeres chloropterus (Bloch).

Labrus chloropterus Bloch: Nat. ausländischen Fische, vol. 5, p. 151, pl. 288, 1791 (type loc., Japan).

Platyglossus chloropterus Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Samoa).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 587, 1882 (New Guinea).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 131, 1913 (Saonek, Waigiu).

Each scale on trunk with blue ocellus, head with broad rosy reticulations, tail uniform. Reaches 170 mm.

Mauritius, East Indies, China, Japan, Polynesia.

Halichoeres gymnocephalus (Schneider).

Labrus gymnocephalus Schneider: Systema ichth., Bloch, p. 251, 1801 (no type locality).

Platyglossus gymnocephalus Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 271, 1909 (Pelew Islands)

? Julis auritus Valenciennes: Hist. nat. Poiss., vol. 13, p. 356, 1839 (type loc., Uléa).

Platyglossus modestus Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Pelew Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 273, 1883 (Engineer Group, New Guinea).

Head 3; depth 3; D. IX, 11, 1; A. III, 10, 1; scales 22 in upper section of lateral line, 4 in lower section to caudal base and 3 more on latter; 5 scales above lateral line, 10 below; predorsal scales 11; snout 2 4/5 in head from its own tip; eye 6 2/5; maxillary 3 7/8; interorbital 4. Least depth of caudal peduncle 2 in head. Head width 2 1/3 in its length. First dorsal spine 4 2/5 in head; last spine 3; ninth dorsal ray 2 4/5; third anal spine 3 7/8; first anal ray 2 2/3; pectoral 1 3/5; ventral 1 7/8. Dark line transversely across pectoral base.

Two in the Bishop Museum from Shortland Island, evidently wrongly given by Seale as Faté, New Hebrides. Length 107 to 140 mm. Both lack the large blackish blotch above the pectoral end shown in Bleeker's figure.

Possibly the nominal *Julis auritus*, based on a drawing by Martens may have been intended for this species. It is noticed as follows: Very pale green. Rosy spot behind eye and another at middle of opercle. Yellowish arc on cheek. Another red band passes under breast. Caudal yellow, other fins pale. Length 128 mm.

East Indies, Philippines, Melanesia, Micronesia.

Macropharyngodon goeffroy (Quoy and Gaimard) (Pl. XXXVIII, *A*).

Julis geoffroy Quoy and Gaimard: Voyage "Uranie," Zool., p. 270, pl. 56, fig. 3, 1824 (type loc., Hawaiian islands).

Julis geoffroyii Valenciennes: Hist. nat. Poiss., vol. 13, p. 351, 1839 (type).

Platyglossus geoffroyi Günther: Cat. fishes Brit. Mus., vol. 4, p. 145, 1862 (Hawaii, Uléa or Celebes?).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Viti Islands; Samoa).

Platyglossus geoffroyi Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 274, 1883 (Hood Bay, New Guinea).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1398, 1906 (Samoa).

Macropharyngodon geoffroyi Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 508, 1900 (Hawaiian islands).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 460, 1902 (1903) (Honolulu).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 261, pl. 143, fig. B, 1909 (Hawaii).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).

Macropharyngodon geoffroy Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 288, 1903 (1905) (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 29, 1925 (Honolulu).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 299, 1928 (Hawaiian islands).

Julis meleagris Valenciennes: Hist. nat. Poiss., vol. 13, p. 352, 1839 (type loc., Uléa).

Macropharyngodon meleagris Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, pt. 1, p. 56, 1906 (Shortland Island).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 298, 1905 (1906) (Apia).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 262, pl. 143, fig. A, 1909 (Duke of York Island; Ponapé).

Anampses caeruleopunctatus (non Rüppell) Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 506, 1900 (Hawaiian islands; part).

Macropharyngodon aquilolo Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 46, fig. 1, 1899 (1900) (type loc., Honolulu).

Head 2 3/5 to 3 3/4; depth 2 1/3 to 3 1/2; D. IX, 11, 1, spines once VI abnormally; A. III, 11, 1; scales 20 to 24 in upper section of lateral line, continuous with 3 to 5 in lower section to caudal base and 1 or 2 more on caudal base; 4 or 5 scales above lateral line, 10 or 11 below; snout 3 to 3 3/5 in head; eye 3 4/5 to 6; maxillary 4 to 4 2/5; interorbital 3 1/2 to 4 1/5.

Head width 2 1/10 to 2 1/3 in its length. Snout conic, long as wide. Eye large, hind edge midway in snout length. Maxillary reaches 3/4 to eye. Front of each jaw with 4 canines protruding forward; at least 1 posterior upper canine each side, in smaller example 2 on left side. Interorbital convex. Gill rakers 5 + 9, about 1/4 of gill filaments, which 1 2/5 in eye. Scales with 19 to 25 basal radiating striae, apical 24 to 35. First dorsal spine 3 1/2 in head; first dorsal ray 2 1/4; third anal spine 3; first anal ray 2 1/2; caudal 1 1/3; pectoral 1 1/4; ventral 1 1/4.

Dull uniform brown generally. Lower scales each with pale median spot and upper more or less mottled. From eye downward on muzzle 3 oblique brown lines, another along preopercle ridge and across lower side of head. All fins except pectoral pale brown with oblique darker or brown lines, often or largely broken as round spots. Gray spots with dark borders and forming vertical bars on caudal. Terminal front membrane of spinous dorsal dusky-brown. Length 100 to 132 mm.

Three Hawaiian specimens in the Academy from J. K. Townsend, one a dried skin. Also 2 others, both poorly preserved, same data, which I wrongly recorded as *Anampses caeruleopunctatus*. Curiously I also found a specimen of *Macropharyngodon geoffroy* labeled as *An-*

ampses caerulopunctatus, No. 14092 in the Agassiz Museum. It is about 152 mm. long and was obtained by Andrew Garrett in Hawaii. Also 3 others obtained by the same in the Agassiz Museum from Maui. The Bishop Museum has one from Honolulu obtained in 1911 which is 156 mm. and one received in 1922. In the National Museum 1 from Hawaii and 1 from Apia. Weber says under *Platyglossus meleagris* (Siboga Exped., vol. 65, p. 376, 1913) with reference to *Platyglossus geoffroyi*:

Letztere gehört aber nach unserer bisherigen Kenntnis ausschliesslich Hawaii an. Die Fauna letzterer Insel enthält überhaupt mehrere Arten, die ihr eigen sind, während nahverwandte, parallele in weiterer Verbreitung vorkommen. So findet der hawaiische *Stethojulis albovittatus* Kölreuter seine westlichere Parallelform in *St. casturi* Gthr., desgleichen der hawaiische *Stethojulis axillaris* Q. & G., der wahrscheinlich in *St. bandanensis* Blkr, eine Parallelform hat, die von den westpacifischen Inseln bis nach Ost-Afrika reicht.

East Indies, Melanesia, Micronesia, Polynesia, Hawaii.

Leptojulis pardalis Kner.

Leptojulis pardalis Kner: Akad. Wiss. Wien, Sitz., vol. 56, p. 728, pl. 3, fig. 2 (9 in text) 1867 (type loc., Viti Islands, Fiji).—Günther: Zool. Record, p. 93, 1872 (=*Platyglossus nigromaculatus* Günther).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 298, 1905 (1906) (Apia).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 301, 1928 (Apia).

Platyglossus pardalis Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 273, 1909 (type of *Platyglossus nigromaculatus*).

Platyglossus nigromaculatus Günther: Zool. Soc. London, Proc., p. 666, pl. 65, fig. B, 1871 (type loc., Savay, Samoa).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 374, 1897 (Rotuma Island).

Halichoeres nigropunctatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 89, 1900 (type loc., Agaña, Guam).

Head 3 1/6; depth 3 1/6; D. IX, 11, 1; A. II, 11, 1; scales 22 in upper section of lateral line, continuous with 4 in lower section to caudal base and 2 more on latter; 5 scales above lateral line, 10 below; 4 predorsal scales; snout 3 1/2 in head measured from its own tip; eye 5; maxillary 4 1/4; interorbital 4.

Body elongately fusiform, deepest near ends of pectoral. Least depth of caudal peduncle 2 in head length. Head width 2 2/5 in its length. Snout conic, long as wide. Eye with hind edge slightly before middle in total head length. Teeth uniserial, with 4 strong forwardly directed canines in front of each jaw, outer upper one recurved each side; strong forward directed upper canine each side at rictus. Interorbital convex. Gill rakers 6 + 12, lanceolate, slender, 1/3 of gill filaments, which 1 1/3 in eye. Scales with 35 basal radiating striae; 36 imperfectly radiating striae apically. Front dorsal spine 5 1/6 in head; first dorsal ray 2 3/4; third anal spine 2 3/4; first anal ray 2 1/3; caudal 1 1/3; pectoral 1 1/3; ventral 1 3/4.

Pale brown generally. Head and trunk covered with numerous large close set deep brown spots, some more or less joined longitudinally in places, becoming smaller and obsolete along edge of back and bases of dorsals. Row of large conspicuous dark brown spots, all along bases of dorsals and anals. Caudal with 5 obscure or pale brown vertical waved lines. Dark spot at bases of lower pectoral rays and larger one on each ventral basally. Length 115 mm.

Described above from the type of *Halichoeres nigropunctatus* in the Bishop Museum, obtained at Agaña on Guam. In the National Museum 3 from Apia.

Micronesia, Polynesia.

Pseudojulis cerasina Snyder.

Pseudojulis cerasina Snyder: U. S. Fish. Comm., Bull., vol. 22, p. 528, 1902 (1904) (type loc., Honolulu).

Head 3 1/10; depth 4 1/3; D. IX, 11; A. III, 12; scales 26 in lateral series, 1 above, 7 below; snout 2 4/5 in head; eye 5; interorbital 5 1/4. Mouth very small, cleft smaller than eye. Canines 2/2, none posterior. Head pale orange, opercle tinted purple above, silvery below. Nape purple. Narrow dorsal area reddish-orange, fading ventrally light orange. Rather diffuse broad pinkish stripe from opercle to caudal base. Body light orange below. Reddish-orange spot, somewhat smaller than pupil at lower edge of pectoral base. Each scale row with narrow line of darker shade than color area. Scaled portion of caudal reddish-orange. Fins orange, spinous dorsal suffused with red. Length 89 mm. (Snyder)

The type, in the National Museum, obtained in 1902.

Coris angulata Lacépède.

Coris angulata Lacépède: Hist. nat. Poiss., vol. 3, pp. 90, 96, pl. 4, fig. 2, 1802 (no type locality).—Fowler: B. P. Bishop Mus., Bull. 38, p. 25, 1927 (Jarvis Island).

Coris aygula Lacépède: Hist. nat. Poiss., vol. 3, pp. 96, 97, pl. 4, fig. 1, 1802 (no type locality) (on Commerson).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 87, 1900 (Guam).—Seale: op. cit., vol. 4, no. 1, p. 58, 1906 (Faté; Tubuai; Tahiti).

Labrus cingulum Lacépède: Hist. nat. Poiss., vol. 3, p. 517, pl. 28, fig. 1, 1802 (type loc., Mauritius).

Coris cingulum Günther: Cat. fishes Brit. Mus., vol. 4, p. 203, 1862 (Aneiteum).—Günther: Cruise of "Curaçoa" (Brenchley), p. 410, 1873 (Solomons).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 34, 1874 (Savay).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 589, 1882 (New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 280, pl. 145, 1909 (Society Islands; Friendly Islands; Solomons; Aneiteum; Upolu).

Coris cyanea Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 588, 1882 (type loc., New Guinea).

Coris variegata (non Rüppell) Ramsay and Ogilby: Linn. Soc. New South Wales, Proc., 2nd ser., vol. 1, p. 131, 1886 (Aneiteum, New Hebrides).

Head 3 to 3 1/8; depth 2 7/8 to 3 1/4; D. IX, 12, 1; A. III, 12, 1; scales 51 or 52, 9 or 10 in lateral line to caudal base and 3 to 7 more on latter; 11 scales above, 23 or 24 below, 16 to 19 predorsal; snout 2 2/3 to 2 7/8 in head; eye 7 2/3 to 9 2/5; maxillary 3 1/8 to 3 3/5; interorbital 4 1/5 to 4 4/5.

Body elongately ovoid, greatly compressed, deepest at middle of depressed pectoral. Caudal peduncle strongly compressed, length 1 4/5 to 2 1/5 in its least depth, which 1 9/10 to 2 1/10.

Head width 2 2/5 to 2 1/2 in its length. Snout conic, width 1 3/4 to 1 4/5 in its length. Eye with front edge slightly behind first third in head length; diameter 3 in snout, 1 1/2 to 1 3/4 in interorbital. Mouth small, gape reaches half way in snout. Lips broad, with plicae. Teeth conic, uniserial, with pair of canines in front of each jaw; some small low inner teeth, mostly anterior in jaws. Nostrils small, together;

first one at last fourth in snout; hind nostril little nearer front one than eye. Interorbital convex. Gill rakers 7 + 10, lanceolate, 2 in gill filaments, which 1 1/6 in eye.

Scales with 30 to 36 basal radiating striae; apical striae 17 to 20; circuli fine. Scales very fine on caudal basally. Tubes in lateral line slender, small, simple. First dorsal spine 2 7/8 to 4 in head; first dorsal ray 2 1/10 to 2 1/5; third anal spine 2 2/3 to 3 1/5; second anal ray 2 1/4 to 2 2/5; caudal 1 1/3 to 1 2/5, rounded convexly behind; pectoral 1 1/2 to 1 3/5; ventral 1 1/4 to 1 2/5.

Deep brown generally, with transverse gray band slightly inclined, at tip of depressed pectoral. Head livid brown, with small gray blue spots and dots, scattered. Opercle with dusky-black blotch on flap, nearly size of eye. Dorsals and anals neutral slaty, edges paler or grayish, with submarginal dusky line. Caudal with deep brownish rounded spot. Pectoral pale olive. Ventral dusky olive. Length 246 to 270 mm.

In the Agassiz Museum 5 adults from the Society Islands and 1 specimen 223 mm. from the Hawaiian islands, all obtained by Andrew Garrett. The last is interesting as an addition to the Hawaiian fauna. I compared it with a specimen of *Coris frerei* Geoffroy St. Hilaire from Mauritius, collected by Nicholas Pike, which though slightly larger has the front dorsal spine filamentous and the ventrals reaching well beyond the anal origin. In the Bishop Museum 1 from Tubuai, 1 Guam and 2 Papeete on Tahiti. Length 236 to 362 mm. Two from Wake Island in 1923.

Likely *Labrus? tagiselem* Thiollière (Fauna Woodlark, p. 191, 1857, type loc., Woodlark Island) may have been intended for this species? It is imperfectly described, from which I gather the following: snout short, lips not prominent. Anal rather short. Caudal peduncle narrow. Above deep brown, below pale, side yellow, tail and dorsal reddish. Black spots on head and front part of trunk. Greatly resembles the European *Labrus maculatus*. *Coris cyanea* Macleay is evidently another variant.

Red Sea, Mauritius, India, Ceylon, East Indies, Japan, Queensland, Melanesia, Micronesia, Polynesia.

Coris greenovii (Bennett).

Julis greenovii Bennett: Zool. Jour., vol. 4, p. 37, 1829 (type loc., Hawaiian islands).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 308, pl. 30, 1903 (1904) (Apia).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 304, 1905 (1906) (Apia).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 281, 1909 (Pelew Islands; Ponapé; Samoa; type).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 384, 1923 (Honolulu).

Coris greenoughii Günther: Cat. fishes Brit. Mus., vol. 4, p. 204, 1862 (type).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 16, 1877 (Pelew Islands).

Coris grenoughi Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 374, 1897 (Rotuma Island).

Coris greenovi Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 70, 1922 (Hawaii).

Coris greenovii Fowler: B. P. Bishop Mus., Bull. 22, p. 15, 1925 (Guam).

Head 3 to 3 1/4; depth 3 1/4 to 3 3/5; D. IX, 10, 1 to 12; A. III, 12; scales 60 or 61 in upper section of lateral line, continuous with 12 to 14 in lower section to caudal base and 5 more on latter; 7 scales above lateral line, 26 or 27 below; 20 to 23 predorsal scales; snout 3 2/5 to 3 1/2 in head measured from its own tip; eye 4 1/2 to 5 1/5; maxillary 4; interorbital 4 1/2 to 5 1/2.

Body elongate, fusiform, strongly compressed. Least depth of caudal peduncle 2 to 2 1/10 in head. Head width 2 3/5 to 2 2/3 in its length. Snout conic, width 1 1/3 to 1 2/5 in its length. Hind eye edge about midway in head length; diameter 1 1/5 in snout. Mouth small. Maxillary to front nostril or 3/4 in snout. Teeth uniserial, conic, anterior pair slightly enlarged and protruding obliquely forward. Front nostril at last third in snout; hind nostril higher and close before eye. Interorbital convex. Gill rakers 6 + 9, lanceolate, rather robust; about 2/3 of gill filaments, which 2 1/5 in eye. Scales with 15 basal radiating striae and 10 apically obsolete. First dorsal spine 2 3/5 to 4 in head; first dorsal ray 2 1/10 to 2 1/2; third anal spine 3 1/5 to 3 1/3; third anal ray 2 to 2 1/2; caudal 1 1/3 to 1 2/5; pectoral 1 1/2; ventral 1 1/2 to 1 3/4.

Faded pale brown, more or less uniform generally. Over dorsal surface 5 saddle-like dusky rings, first on snout, second above eye and little posterior, third at front of spinous dorsal, fourth at front of soft dorsal, fifth on caudal peduncle above and sixth as dark transverse bar on upper 2/3 of caudal. Eye pale slaty. Edges of both dorsals and anals narrowly dull dusky. Length 100 mm.

One in the Bishop Museum obtained by J. W. Thompson in the Honolulu market in 1910. Also 1 from Guam in 1923. An adult specimen in the National Museum from Apia. Two fine specimens, 62 and 65 mm. long, in the Agassiz Museum, from Ebon Island.

Micronesia, Polynesia, Hawaii.

Coris ballieui Vaillant and Sauvage (Pl. XXXVIII, *C*).

Coris ballieui Vaillant and Sauvage: Rev. Mag. Zool., 3rd ser., vol. 3, p. 285, 1875 (type loc., Hawaiian islands).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 310, pl. 32, 1903 (1905) (Honolulu; Hilo).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 71, Dec., 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 29, 1925 (Honolulu) (♂).

Coris bailleui Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 276, 1909 (Honolulu).

Coris ballieni Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).

Hemicoris baillieui Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 461, 1902 (1903) (Honolulu).

Hemicoris ballieui Snyder: U. S. Fish Comm., Bull., vol. 22, p. 528, 1902 (1904) (Honolulu).

Coris rosea Vaillant and Sauvage: Rev. Mag. Zool., 3rd ser., vol. 3, p. 286, 1875 (type loc., Hawaiian islands).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 311, fig. 132, 1903 (1905) (Honolulu; Hilo).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 276, 1909 (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 71, Dec. 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 29, 1925 (Honolulu) (♀).

Hemicoris rosea Snyder: U. S. Fish Comm., Bull., vol. 22, p. 528, 1902 (1904) (Honolulu).

Coris argenteostriata Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 507, pl. 3, fig. 1, 1901 (type loc., Honolulu) (♀).

Hemicoris argenteo-striata Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 461, 1902 (1903) (Honolulu).

Coris shauinslandii Steindachner: Akad. Wiss. Wien. Denk., vol. 70, p. 508, pl. 5, fig. 1, 1901 (type loc., Honolulu) (♂).

Coris shauinslandi Seale: B. P. Bishop Mus., Occ Papers, vol. 1, no. 5, p. 16, 1902 (Honolulu).

Hemicoris kaleipionis Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 51, fig. 6, 1899 (1901) type loc., Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 18, 19, 1902 (Honolulu) (♀).

In the Bishop Museum 12 from Honolulu. I examined 51 in the Honolulu markets in November and December, 1922. Of *Coris rosea* 7 in the Bishop Museum from Honolulu, and I found 71 in the Honolulu markets with the above, also 1 January 1, 1923. The National Museum has 2 from Maui obtained by the Wilkes Expedition; through the Bureau of Fisheries 3 Hawaiian specimens; also 4 Hawaiian specimens of *Coris rosea*. The Agassiz Museum has an adult *Coris rosea* from the Hawaiian islands. In the Academy 2 Hawaiian specimens.

Coris cuvieri (Bennett).

Julis cuvieri Bennett: Zool. Soc. London, Proc., vol. 1, p. 128, 1831 (type loc., Mauritius).

Coris cuvieri Günther: Cat. fishes Brit. Mus., vol. 4, p. 199, 1862 (Aneiteum).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 277, 1909 (Aneiteum).

Head 4 in total; depth little over 4; D. IX, 12; A. III, 12; scales 80 to 85. Upper lip broad, with folds; lower not continuous with that of other side, pendent. Front dorsal spine produced. Caudal subtruncate. Ventral long, pointed. Brownish-violet, with blue or green dots. Head with 3 broad brownish-red bands. Inner half of dorsal and anal with numerous irregular oblique violet lines, outer half blackish-violet. Caudal blackish-violet, basal portion lighter and dotted blue. (Günther)

Zanzibar, Mauritius, Melanesia.

Coris variegata (Rüppell).

Halichoeres variegatus Rüppell: Neue Wirbelth. Fische, p. 14, pl. 4, fig. 2, 1835 (type loc., Massaua, Red Sea).

Coris variegata Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 275, 1883 (Pitt Bay, New Guinea).—Weber: Zool. Forsch. Australien (Semon), vol. 5, p. [112] 272, 1895 (coast of New Guinea).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 384, 1923 (Honolulu).

Head 3 1/5 to 3 2/5; depth 3 2/3 to 3 3/4; D. IX, 12, 1; A. III, 12, 1; scales 40 or 41 in upper section of lateral line, 6 or 7 in lower section to caudal base and 3 more on latter; 4 scales above lateral line, 17 below; 11 to 14 predorsal scales; snout 3 2/5 in head; eye 4 3/4 to 4 4/5; maxillary 4 2/5 to 4 2/3; interorbital 4 3/5 to 6.

Body elongately fusiform, strongly compressed. Least depth of caudal peduncle 2 to 2 1/4 in head. Head width 2 2/5 to 2 1/2 in its length. Snout conic, compressed, width 1 1/6 in its length. Eye with hind edge about midway in head length. Teeth uniserial, conic; 2 canines in front of each jaw slightly enlarged. Lips cover teeth. Interorbital broadly convex. Infraorbital width slightly less than eye. Gill rakers 6+10, lanceolate, 2/3 of gill filaments, which 2 1/2 in eye. Scales with 19 basal radiating striae and 3 or 4 auxiliaries; apical 37, obsolete, slightly radiating, incomplete striae. First dorsal spine 3 1/4 to 4 in head; last spine 2 1/6 to 2 3/5; eleventh dorsal ray 2 to 2 3/5; third anal spine 3 2/3 to 3 3/4; eleventh anal ray 2 1/4 to 2 1/2; caudal 1 1/4 to 1 1/3; pectoral 1 1/2; ventral 1 4/5 to 1 9/10.

Pale brown generally, fins with buff tinge. Traces of brown band along side of snout to opercle flap. Blackish crescent in opercular flap. Six broad deep brown double vertical bands on back and sides, with few more or less reticulate blotches or lines, most conspicuous in smaller specimens, and all reflected on bases of both dorsals and anals. Black spot, less than pupil at bases of 2 last dorsal rays and in smaller example another blackish smaller spot at origin of upper caudal lobe. Length 94 to 107 mm.

In the Bishop Museum 2 obtained in the Honolulu markets by J. W. Thompson. Both specimens differ from Bleeker's figure in the prominence of the small black crescent on the opercular flap and the black blotch at the bases of the last 2 dorsal rays.

Not previously reported from Polynesia or the Hawaiian islands.

Red Sea, East Indies, Hawaii.

Coris venusta Vaillant and Sauvage.

Coris venusta Vaillant and Sauvage: Rev. Mag. Zool., vol. 3, p. 285, 1875 (type loc., Hawaii).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 312, fig. 133, pl. 31, 1903 (1905) (Honolulu, Hilo).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 275, pl. 144, figs. A-B, 1909 (Hawaiian islands).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 71, Dec. 1922 (Hawaii).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 307, 1928 (Midway Reefs, Hawaii, Honolulu).

Hemicoris venusta Snyder: U. S. Fish Comm., Bull., vol. 22, p. 528, 1902 (1904) (Honolulu).

Hemicoris remedius Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 49, fig. 5, 1899 (1900) (type loc., Honolulu).—Jenkins: op. cit., vol. 22, p. 461, 1902 (1903) (Honolulu).

Julis aygula (non Lacépède) Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 510, 1900 (Hawaiian islands).

The National Museum has 1 from Maui obtained by the Wilkes Expedition 158 mm. long. Also 5 Hawaiian specimens through the Bureau of Fisheries and 4 from Honolulu. The Bishop Museum has 28 from Honolulu. I found 3 in the Honolulu markets, December, 1922. A very beautiful fish in life with obliquely-vertical pale green bands on the tail, the vertical fins ocellated and blotched green on orange and 3 blue-green arcs on the cheek extended back and down on side of thorax. The Agassiz Museum has 8 from Honolulu, most of them obtained through Andrew Garrett. In the Academy 7 from Honolulu, mostly through J. K. Townsend.

Coris multicolor (Rüppell).

Halichoeres multicolor Rüppell: Neue Wirbelth. Fische, p. 15, pl. 4, fig. 3, 1835 (type loc., Djedda, Red Sea).

Coris multicolor Günther: Cat. fishes Brit. Mus., vol. 4, p. 198, 1862 (Aneiteum, New Hebrides).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 507, pl. 5, fig., 1901 (Honolulu, Laysan).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 274, 1909 (Solomons).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 22, 1925 (Wake Island).

Julis multicolor Günther: Cruise of "Curaçoa" (Brenchley), p. 410, 1873 (Solomons).

Differs from *Coris venusta* in 2 or 3 blue longitudinal bands on terminal portions of dorsals and anals. Six dark saddles on back. Blue predorsal band and another from snout to eye and back along upper course of lateral line. Length 152 mm. (Rüppell)

One in Bishop Museum from Laysan 162 mm. in 1923.

Red Sea, Natal, Melanesia, Hawaii.

Coris flavovittata (Bennett) (Pl. XXXIX, *A*).

Julis flavovittatus Bennett: Zool. Journ., vol. 4, p. 36, 1829 (type loc., Hawaiian islands).

Julis flavovittata Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 511, 1900 (Hawaiian islands).—Snyder: U. S. Fish Comm., Bull., vol. 22, p. 528, 1902 (1904) (Laysan Island).—Fowler: Copeia, no. 112, Nov. 20, p. 83, 1922 (Hawaii).

Coris flavovittata Günther: Cat. fishes Brit. Mus., vol. 4, p. 205, 1862 (type).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 18, 1902 (Honolulu).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 282, 1909 (Hawaiian islands).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 14, 29, 1925 (Guam; Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 23, 1925 (Laysan).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100. p. 310, 1928 (Hawaii, Honolulu).

Coris flavovittatus Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 70, Dec. 1922 (Laysan).

Julis eydouxii Valenciennes: Hist. nat. Poiss., vol. 13, p. 333, 1839 (type loc., Hawaiian islands).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 461, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 309, pl. 29, 1903 (1905) (Honolulu; Hilo).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 23, 1925 (Necker).

Julis eydouxi Snyder: U. S. Fish Comm., Bull., vol. 22, p. 528, 1902 (1904) (Honolulu).

Coris eydouxi Jordan and Jordan: U. S. Fish Comm., Bull. 22, p. 528, 1902 (1904) (Hawaii).

The National Museum has 1 from Maui, 1 Oahu and 1 Hilo, all obtained by the Wilkes Expedition. Also 3 others through the Bureau of Fisheries from Hawaii. The Bishop Museum has 6 from Honolulu, largest 445 mm. I examined 140 specimens in the Honolulu markets during November and December, 1922. One from Guam and 1 from Necker in 1923. The young with 5 black longitudinal bands, of which only 2 upper persist with age when whole lower side rosy. In the Agassiz Museum 6 Hawaiian specimens from Andrew Garrett and 2 from Honolulu through W. H. Jones. The Academy has 4 Hawaiian specimens, of which 2 obtained by J. K. Townsend.

Coris gaimard (Quoy and Gaimard) (Pl. XXXIX, *B*).

Julis gaimard Quoy and Gaimard: Voyage "Uranie," Zool., p. 265, pl. 54, fig. 1, 1824 (type loc., Maui, Hawaiian islands).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 460, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 305, 1903 (1905) (Honolulu; Hilo).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).

Iulis gaymardi Kittlitz: Denkw. Reise Mikronesien, vol. 2, p. 159, 1858 (Uléa).

Coris gaimardi Valenciennes: Hist. nat. Poiss., vol. 13, p. 366, 1839 ("Mowi," Hawaiian islands).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 510, 1900 (Hawaii).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 18, 19, 1902 (Honolulu).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 277, 1909 (Yap; Hawaiian Islands; Pelew Islands; Carolines).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 70, Dec. 1922 (Hawaii).

Coris gaimardii Schmeltz: Mus. Godeffroy, Cat. 5, p. 34, 1874 (Tahiti).

Coris gaimard Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 311, 1928 (Hawaii, Apia, Honolulu, Kambara).

Coris pulcherrima Günther: Cat. fishes Brit. Mus., vol. 4, p. 200, 1862 (type loc., Amboyna; Tabitti; Aneiteum).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Viti Islands).—Schmeltz: op. cit., Cat. 5, p. 34, 1874 (Samoa).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 589, 1882 (New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 87, 1900 (Agaña, Guam).—Steindachner: Denks. Akad. Wiss. Wien, vol. 70, p. 507, 1901 (Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 18, 19, 1902 (Honolulu).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 278, 1909 (New Hebrides, Samoa, Society Islands, Hawaiian islands).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 70, Dec. 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 14, 29, 1925 (Guam; Honolulu).

Julis pulcherrima Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 460, 1902 (1903) (Honolulu).—Snyder: op. cit., p. 528, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 305, pl. 27, 1903 (1905) (Honolulu, Hilo, Kailua).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 57, 1906 (Tahiti).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 304, 1905 (1906) (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 300, 1911 (Kambara, Fiji).—Fowler: Copeia, no. 112, Nov. 20, p. 83, 1922 (Hawaii).

Coris formosa (non J. W. Bennett) Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).

Head 3 2/5 to 3 4/5; depth 3 2/5 to 4; D. IX, 12, 1; A. III, 12, 1; scales 54 to 59, 10 to 12 in lateral line to caudal base and 3 to 5 more on latter; 8 or 9 scales above lateral line, 27 to 29 below, predorsal 16 to 18; snout 2 4/5 to 3 1/8 in head; eye 6 to 6 1/5; maxillary 3 2/5 to 3 1/2; interorbital 4 3/4 to 5.

Head width 2 2/5 to 2 3/5 in its length. Snout conic, width 1 2/5 to 1 3/5 its length. Eye with hind edge slightly before head center. Maxillary largely concealed, not quite to eye. Canines 2/2, lower closer and fitting between upper. Interorbital widely convex. Gill rakers 7+10, lanceolate, 1 3/4 in gill filaments, which 1 1/2 in eye. Scales with 20 to 22 basal radiating striae, obsolete apical 15 to 34, circuli fine. First dorsal ray filamentous, 1 1/5 in head. Dull uniform brownish largely. Fins pale, marginal line of brown on dorsals and anals. Dorsals with row of fine brown spots, more as line on spinous fin, extending along outer half of fin. Basal half of dorsals with irregular scattered small brown blotches. Anal similar. Length 193 to 230 mm.

The Academy has 5 specimens from Hawaii, of which 1 from Thomas Nuttall and 1 from J. K. Townsend. One in the National Museum from Fiji, 208 mm. long, obtained by the Wilkes Expedition. Also 3 Hawaiian specimens from the Bureau of Fisheries, 2 Honolulu, 1 Apia and 1 from Kambara in Fiji. The Bishop Museum has 31 from Honolulu, 7 Tahiti and 2 Guam. Length 142 to 317 mm. One from Guam in 1923. The Agassiz Museum has 5 Hawaiian specimens from

the Bureau of Fisheries, 2 from Andrew Garrett and 2 from C. F. Winslow, 4 Society Islands also through Andrew Garrett and 1 from Ascension Island through Rev. B. G. Snow in 1877.

Zanzibar, Ceylon, East Indies, Riu Kiu, Micronesia, Melanesia, Polynesia, Hawaii.

Coris lepomis Jenkins (Pl. XXXIX, *C*).

Coris lepomis Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 48, fig. 4, 1899 (1900) (type loc., Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 70, 1922 (Hawaii).—Fowler: B. P. Bishop Mus. Bull. 22, p. 29, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 23, 1925 (French Frigates Shoal).

Julis lepomis Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 461, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 306, fig. 131, 1903 (1904) (Honolulu; Hilo).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 278, 1909 (Honolulu).

Head 3 1/8; depth 3 1/8; D. IX, 1; A. III, 12, 1: scales 68 in upper section of lateral line, 13 continuous in lower section to caudal base and 2 more on latter; 7 scales above lateral line, 35 below; 19 predorsal scales; snout 3 in head; eye 9; maxillary 3 5/6; interorbital 4. Least depth of caudal peduncle 2 in head. Head width 2 1/6 in its length. Gill rakers 7+12, elongate, small, 2 1/2 in gill filaments or 2 1/5 in eye. Scales with 23 basal radiating striae, with 1 to 3 more incompletely auxiliaries. First dorsal spine 2 in head; first dorsal ray 2 1/5; third anal spine 4 1/6; fifth anal ray 2 1/8; caudal fin 1 1/2; pectoral 1 2/3; ventral 1 3/4. Largely dull brown, paler spots and blotches on side of head and breast obsolete. Dorsals and anals and caudal all slightly darker. Pectoral and ventral very pale. Black blotch on opercle size of eye. Length 394 mm.

One in the Bishop Museum from Honolulu. I examined 13 specimens in the Honolulu markets in December, 1922, and January, 1923. Also 5 from French Frigates Shoal in 1923. One from Honolulu in the National Museum. Two adults in the Agassiz Museum obtained by Andrew Garrett in the Hawaiian islands, were indicated many years ago by Steindachner as new.

Coris papuensis Macleay.

Coris papuensis Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 275, 1883 (type loc., southeast coast of New Guinea).

Head 4 in total; depth 4; D. IX, 14; A. II, 11: scales 52. Snout long and pointed. Eyes very small. Caudal truncate. Pale yellow, with 3 or 4 or more indistinct dark crossbands from back towards belly, with small bright pearly spot on ventral half of body. Head with 3 black spots, 1 before eye, another behind and third behind that, probably forming black streak. Fins colorless, minute black dot on membrane between first and second dorsal spine, still more minute one on ninth dorsal ray and bright ocellus on second. (Macleay)

Greatly suggestive of *Coris batuensis* (Bleeker), but that species is said to have but 11 dorsal rays and no black spot on last dorsal rays.

Coris heteroptera (Bleeker).

Julis (Halichoeres) heteropterus Bleeker: Soc. Sci Ind. Neerl., Act. (Amboina), vol. 2, p. 78, 1857 (type loc., Amboina).

Coris heteroptera Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 283, 1909 (Tahiti).

Head 3 1/4; depth 3; D. IX, 12, 1; A. III, 12, 1; scales 76 in lateral line, 4 above to soft dorsal origin, 21 below; snout 3 1/2 in head; eye 6 in head or 1 2/3 in snout. First 2 dorsal spines little produced and upper and lower caudal points more so. Head and trunk dusky violaceous, likewise tail, which crossed by 7 or 8 greenish-yellow transverse bands. Blue blotch on opercular flap. Iris blue. Dorsals and anals dusky violaceous, edged yellowish and anals basally same. Caudal violaceous-fuscus, broadly yellowish behind medially. Paired fins yellowish, pectoral darker basally. Length 215 mm. (Bleeker)

East Indies, Polynesia.

Hologymnosus semidiscus (Lacépède).

Labrus semidiscus Lacépède: Hist. nat. Poiss., vol. 3, pp. 429, 473, pl. 6, fig. 2, 1802 (type loc., Great Gulf of India).

Hologymnosus semidiscus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 57, 1906 (Rarotonga; Tahiti).

Labrus doliatus (Commerson) Lacépède: Hist. nat. Poiss., vol. 3, pp. 429, 473, pl. 6, fig. 3, 1802 (type loc., Great Gulf of India).

Labrus annulatus Lacépède: Hist. nat. Poiss., vol. 3, pp. 455, 526, pl. 28, fig. 3, 1802 (type loc., "Great Equatorial Ocean" [Indo-Pacific]).

Coris annulatus Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Viti Islands).

Coris semipartita [Günther: Cat. Fishes British Mus., vol. 4, p. 203, 1862 (type loc., Mauritius?)] Schmeltz: Mus. Godeffroy, Cat. 6, p. 16, 1877 (Huahine).

Coris annulata Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 588, 1882 (New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 280, pl. 146, fig. A, 1909 (Pelew Islands; Kingsmills; Society Islands).

Coris elongata Günther: Cat. fishes Brit. Mus., vol. 4, p. 201, 1862 (type loc., Aneiteum, New Hebrides).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 279, 1909 (Aneiteum).

Coris longipes Günther: Cat. fishes Brit. Mus., vol. 4, p. 204, 1862 (type loc., Aneiteum, New Hebrides).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 280, 1909 (type).

Head 2 9/10 to 3 1/2; depth 3 7/8 to 4 7/8; D. IX, 12; A. III, 12; tubular scales 73 to 87, 21 to 27 in lateral line to caudal base and 9 or 10 more on latter; 12 to 14 scales above, 40 to 42 below, 23 to 26 predorsal; snout 2 1/2 to 2 2/3 in head; eye 8 3/4 to 10; maxillary 3 1/2 to 3 4/5; interorbital 5 4/5 to 6 1/5.

Body elongate, nearly fusiform, slender, deepest about middle of depressed pectoral. Caudal peduncle strongly compressed, length 1 1/5 in its least depth, which 3 1/8 to 3 1/3 in head.

Head width 3 in its length. Snout conic, width 2 2/5 in its length. Eye small, hind edge midway in head length; diameter 3 3/4 in snout, 1 2/3 in interorbital. Mouth moderate, horizontal, jaws even. Lips wide, plicate on inner surfaces at least above. Maxillary reaches 3/5 to eye. Teeth uniserial, conic, 4 canines in front of each jaw; inside each jaw few low blunt teeth, more or less soldered or as if on plate. Nostrils close together, front one smaller and about last fourth in snout. Interorbital convex. Preopercle edge entire. Gill rakers 6+13, robust points, spinescent, 2 3/4 in gill filaments, which equal eye.

Scales with 18 to 22 basal radiating striae; circuli fine. Head naked. Caudal base finely scaled. Tubes in lateral line small, slender, simple. First dorsal spine 4 4/5 in head, last 3 1/2; first dorsal ray 2 3/4 to 2 4/5; third anal spine 4 1/5; first anal ray 3 1/10;

caudal 1 2/3 to 1 5/6, emarginate, double concave as expanded; pectoral 1 3/4 to 2; ventral 2 4/5 to 3.

Largely uniform pale brown to dull blackish-brown. Very obscure traces of 22 slightly darker vertical crossbands. Small neutral-dusky blotch on upper opercle edge. Teeth white. Iris golden. Dorsals with traces of brown submarginal line and soft fin with narrow brown edge. Traces of obscure dark blotches along soft dorsal medianly. Other fins uniform brownish.

In the Agassiz Museum 1 from Society Islands, obtained by Andrew Garrett. Length 312 mm. In the Bishop Museum 2 from Tahiti and 1 from Rarotonga. Length 245 to 345 mm.

Readily known among all the labroids of Oceania by its very small scales.

Mauritius, Seychelles, East Indies, Melanesia, Micronesia, Polynesia.

Thalassoma quinquevittatus (Lay and Bennett).

Scarus quinquevittatus Lay and Bennett: Zool. Beechey's voyage, p. 66, pl. 19, fig. 3, 1839 (type loc., "Loo Choo Islands" [Riu Riu]).

Thalassoma quinquevittatus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 316, 1928 (Fanning, Apia).

? Julis coris Lesson: Soc. Hist. nat., Poiss., Mem., vol. 4, p. 404, 1828 (type loc., Oualan).—Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 137, 1830 (Oualan).

Julis guntheri Bleeker: Akad. Wet. Amsterdam, Verslagen, vol. 13, p. 279, 1862 [on *Julis (Julis) quadricolor*, non Lesson, Bleeker: Soc. Sci. Ind., Neerl., Act., Manado, vol. 1, p. 55, 1856, type loc., Celebes; Sangi].—Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Samoa).—Günther: Cruise of "Curaçoa" (Brenchley), p. (410) 425, pl. 32, fig. A, 1873 (Solomons).—Streets: U. S. Nat. Mus., Bull., no. 7, p. 83, 1877 (Fanning Islands).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 16, 1877 (Paumotus).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 275, 1883 (Engineer Group, New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 294, pl. 144, fig. C, 1909 (Paumotus, Society Islands, Samoa, Kingsmills, Fanning Islands, Solomons, Lifu, Loyalty Islands, Futuma).

Thalassoma guntheri Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1399, 1906 (Samoa).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 305, 1905 (1906) (Apia).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 24, 1925 (French Frigates Shoal, Wake Island).

Head 2 4/5 to 3; depth 3 1/4 to 3 3/4; D. VIII, 13, 1; A. II, 11, 1; scales 25 or 26 in lateral line to caudal base and 2 more on latter; snout 2 7/8 to 3 1/8 in head; eye 4 4/5 to 5 1/5; maxillary 3 3/5 to 4 1/5; interorbital 4 to 4 1/3. Least depth of caudal peduncle 2 1/8 to 2 3/4 in head; head width 2 1/8 to 2 1/3. Snout width 1 1/5 to 1 1/4 its length. First dorsal spine 5 1/4 to 6 2/3 in head, last spine 2 3/4 to 4 3/4; first dorsal ray 2 2/5 to 2 7/8; second anal spine 3 3/4 to 4 4/5; first anal ray 2 1/2 to 2 4/5; caudal 1 1/4 to 1 2/5; pectoral 1 1/3 to 1 3/5; ventral 2 1/4 to 2 2/3.

The Agassiz Museum has 11 from the Society Islands and 2 from the Kingsmills, through Andrew Garrett. Also 2 from Ebon Island, through Rev. B. G. Snow. The Bishop Museum has 8 specimens, called "Matingan," obtained by Alvin Seale at Agaña, Guam, June 14, 1900. Length 55 to 105 mm. One from French Frigates Shoal and 17 from Wake Island in 1923. In the National Museum 2 without locality, though doubtless from Fiji or Samoa, obtained by the Wilkes Expedition. Also 3 from the Fanning Islands through T. H. Streets and 1 from Apia.

Possibly *Julis coris* Lesson is intended for this species, as it evidently refers to *Thalassoma*. It is described: Head violet, bands golden. Body with 2 longitudinal orange bands, median larger and deeper. Belly pale rose. Iris yellow, edged brown. Fins yellow, with spots or edges brown. Length 102 mm.

Cape of Good Hope, East Indies, Philippines, Riu Kiu, Melanesia, Micronesia, Polynesia.

Thalassoma whitmii (Günther).

Julis whitmii Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 291, pl. 148, 1909 (type loc., Raiatea and Huahine, Society Islands).

Head 3 1/8; depth 3 3/5; D. VIII, 12; A. III, 11; scales 20, 5+3, 3 above, 9 below; snout 3 in head; eye 4 3/4, 1 3/5 in snout. Back olive, below clear rosy, separated by blackish band 2 scales wide from opercle to caudal base medially. On lower side green band from side of throax, below pectoral to lower median caudal rays. Head green, 3 red bands radiating from eye posteriorly and 1 forward to snout; 2 extend back from mouth corner to form loup on opercle below. Dorsals and anals clear green, first with median red band longitudinally and small black spot on first 2 membranes. Caudal yellow, edge red above and below. Length 95 mm. (Günther)

Thalassoma hardwicke (J. W. Bennett).

Sparus hardwicke J. W. Bennett: Select. fish. Ceylon, pl. 12, 1828-30 (type loc., Ceylon).

Thalassoma hardwicke Fowler: B. P. Bishop Mus., Bull. 22, p. 35, 1925 (Samoa).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 317, 1928 (Apia).

Julis dorsalis Quoy and Gaimard: Voyage "Astrolabe," Zool., vol. 3, p. 713, pl. 15, fig. 5, 1834 (type loc., Mauritius).—Bleeker: Atlas ichth., vol. 1, p. 94, pl. 34, fig. 4, 1862 (Doreh, New Guinea).—Günther: Cat. fishes Brit. Mus., vol. 4, p. 190, 1862 (Aneiteum; Ngau Island, Fiji).—Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Viti Islands).—Peters: Akad. Wiss. Berlin, Monatsb., p. 843, 1876, (1877) (New Ireland).—Günther: Rept. voyage "Challenger," vol. 1, p. 36, 1880 (Ovalau, Fiji).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 274, 1883 (Engineer Group, New Guinea).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 37, 1885 (Rubi, New Guinea).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 102, pt. 1, p. 238, 1893 (New Hebrides).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 374, 1897 (Rotuma).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 295, 1909 (Society Islands; Samoa).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 130, 1913 (Saonek, Waigiu).

Julis (Julis) dorsalis Bleeker: Soc. Sci. Ind. Neerl., Act. no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).

Thalassoma dorsale Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1399, 1906 (Upolu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 57, 1906 (Shortland Island).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 307, 1905 (1906) (Pago Pago, Apia).

Head 2 7/8 to 3; depth 3 1/4 to 3 1/2; D. VII or VIII, 13, 1 or 14, 1; A. II, 11, 1; scales 21 or 22 in upper section of lateral line, followed by 5 more to caudal base and 1 on latter; 4 scales above lateral line, 9 below; 8 predorsal scales; snout 2 1/2 to 3 in head; eye 5 1/4 to 6; maxillary 3 2/3 to 4 1/3; interorbital 4 1/10 to 4 1/6.

Head width 2 1/3 to 2 2/5 in its length. Snout

conic, width 1 1/3 to 1 3/5 in its length. Eyes moderate, hind edge very slightly behind center in head length. Lips moderate. Pair of canines in front of each jaw, lower pair closer. Interorbital convex. Gill rakers 5+16, slender, lanceolate, 2 1/2 in gill filaments, which 1 1/3 in eye. Scales with 32 to 42 basal radiating striae, apical 24 to 29.

Color-pattern agrees entirely with that of *Thalassoma melanochir* with addition of dark blotch at pectoral origin. Head shows more pale bluish bands. One on cheek not quite to its lower edge. Triangular pale bluish blotch on side of snout, not quite to its edge, also band forward from lower eye edge to maxillary. Pale bluish band connects eyes and extended back along upper side of head till above opercle. Length 97 to 153 mm.

Two in the Academy from Apia. Seven in the National Museum from Apia. Eight in the Bishop Museum from Shortland Island, largest 189 mm. In the Agassiz Museum 2 from Apia, 2 from Ebon Island, through Rev. B. G. Snow, 1 from Ponapé through Rev. L. H. Gulick and 12 from the Society Islands through Andrew Garrett.

Sparus hardwicke J. W. Bennett is evidently the earliest name available. I have also examined the second edition of Bennett's work in the Academy library and find it dated 1834. Günther quotes *Julis hardwickii* Gray (Illus. Indian Zool., pt. 1, pl. 92, 1830-32 [which bears the date of 1831], fig 1) as if earlier than *Sparus hardwicke* J. W. Bennett. Thus Bennett's name has clear priority over *Julis dorsalis* Quoy and Gaimard, which is largely in use. *Thalassoma melanochir* Fowler (Acad. Nat. Sci. Philadelphia, Jour, 2nd ser., vol. 12, p. 537, pl. 20, middle figure, 1904, type loc., Padang, Sumatra) supposed to be distinguished by its black pectoral and broad rosy lateral band is really another synonym.

Zannzibar, Mozambique, Natal, Mauritius, Ceylon, East Indies, Philppines, China, Riu Kiu, Japan, Queensland, Melanesia, Micronesia, Polynesia.

Thalassoma schwanefeldii (Bleeker).

Julis (*Julis*) *schwanenfeldii* Bleeker: Nat. Tijds. Ned. Ind., vol. 4, p. 288, 1853 (type loc., Cauer, Sumatra).

Julis schwanfeldii Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Savay).

Julis schwanefeldii Streets: U. S. Nat. Mus., Bull., no. 7, p. 99, 1877 (Samoa).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 296, 1909 (Tahiti; Pelew Islands).

Thalassoma schwanefeldii Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 57, 1906 ("Tubuai, Austral Islands").

Thalassoma dorsale (non Quoy and Gaimard) Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 131, 1902 (1903) (Marcus Island).

Head 3; depth 3 1/6; D. VIII, 13, 1; A. III, 10, 1; scales in lateral line 20 in upper section followed by 5 to caudal base and 1 more on latter; 4 scales above lateral line, 9 below; 8 predorsal scales; snout 3 in head; eye 4 2/3; maxillary 4; interorbital 4 1/5. Least depth of caudal peduncle 2 1/5 in head. Head width 2 1/3 in its length. Axillary scale very large, extending from lateral line to pectoral origin all along shoulder-girdle. First dorsal spine 7 2/5 in head; first branched dorsal ray 2 1/3; third anal spine 3 1/2; first anal ray 2 2/5; caudal 1 2/5; pectoral 1 1/2; ventral 2 1/4. Length ?

In the Bishop Museum 1 from Marcus Island and one labelled Tahiti, Society Islands, February 1901, but recorded by Seale as from "Tubuai, Austral Islands," likely a slip. One in the National Museum from Samoa through Steinberger.

East Indies, Philippines, Micronesia, Polynesia.

Thalassoma lunare (Linné).

Labrus lunaris Linné: Systema nat., 10th ed., p. 283. 1758 (type loc., in Indiis).

Julis lunaris Valenciennes: Hist. nat. Poiss., vol. 13, p. 299. 1839 (Tahiti).—Thiollière: Fauna Woodlark, p. 193. 1857 (Woodlark Island).—Günther: Cat. fishes Brit. Mus., vol. 4, p. 180, 1862 (Aneiteum).—Bleeker: Akad. Amsterdam, Verslangen, 2nd ser., vol. 2, p. 281, 1868 (Doreh, New Guinea).—Günther: Cruise of "Curaçoa" (Brenchley), p. 420, 1873 (Solomons).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 34, 1874 (Tonga; Apaman Island; Gilberts).—Streets: U. S. Nat. Mus., Bull., no. 7, p. 84, 1877 (Fanning Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 588, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 276, 1883 (southeast New Guinea).—Waite: Australian Mus., Mem., no. 3, p. 193, 1897 (Funafuti, Ellice Islands).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 287, 1909 (South Sea; Hawaiian islands).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 302, 1911 (Jaluit, Marshalls).

Julis (*Julis*) *lunaris* Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, pp. 3, 4, 1859 (Doreh, New Guinea).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).

Thalassoma lunare Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 57, 1906 (Shortland Island).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 321, 1928 (Fanning, Jaluit).

Julis maculata Lesson: Soc. Hist. Nat. Paris, Mem., vol. 4, p. 402, 1824 (type loc., Oualan).—Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 136, 1830 (Oualan).

Labrus lorius (Solander) Valenciennes: Hist. nat. Poiss., vol. 13, p. 301, 1839 (name in text) (type loc., Tahiti).

Labrus ornatus (Solander) Valenciennes: Hist. nat. Poiss., vol. 13, p. 301, 1839 (name in text).

Julis mertensii Valenciennes: Hist. nat. Poiss., vol. 13, p. 308, 1839 (type loc., Ulea).

Girelle lakibik (Montrouzier) Thiollière: Fauna Woodlark, p. 193, 1857 (name in synonymy).

Julis rapan Thiollière: Fauna Woodlark, p. 195, 1857 (type loc., Woodlark Island).

Head 3 2/5; depth 3 2/3; D. VII to IX, 13 1; A. II, 11, 1; scales 21 in upper section of lateral line, continuous with 5 to caudal base and 1 more on latter; 4 scales above lateral line, 8 below; 6 predorsal scales; snout 3 1/4 in head; eye 6 2/3; maxillary 4; interorbital 4 1/10.

Least depth of caudal peduncle 1 3/5 in head. Head width 2 1/5 in its length. Gill rakers 7 + 12, lanceolate, 1/3 of gill filaments, which 1 1/8 in eye. Opercle with 3 scales above. First dorsal spine 5 1/2 in head; first dorsal ray 2 1/2; second anal spine 4 2/5; first anal ray 3; caudal little longer than head; pectoral 1 1/3; ventral 1 1/3.

Head slaty-blue, with purplish longitudinal bands, several crossing mandible, leaving orange patches. Body olivaceous-brown, becoming dull orange along dorsal bases and dusky on caudal base together with edges of each lobe. Each scale on trunk with 1 or more vertical

dusky lines. Dorsals and anals margined with yellow, then white and finally dusky submarginal band, which rich red on spinous fin and becomes blackish on rayed fins or posteriorly. Upper half of pectoral blackish, rest of fin more or less yellowish. Ventral yellow, also inner subbasal portions of median caudal rays, latter becoming white terminally. Breast with 3 broad slaty-gray horizontal bands each side. Eye yellowish. Front edge of ventral reddish.

The Bishop Museum contains 1 from Palmyra Island, obtained by Thurston and Thaanum in 1922, 253 mm. long. Also 2 smaller specimens from Shortland Island, with a few more opercular scales. In the National Museum 3 adults from the Fanning Islands through T. H. Streets and one from Jaluit in the Marshalls. The Agassiz Museum has 5 from the Society Islands obtained by Andrew Garrett.

This species has much the general appearance of the male of *Thalassoma duperrey*. It differs, however, in the absence of the broad orange area immediately following the head and in the presence of distinct longitudinal lines on the sides of the head. Also the red pectoral band (black in alcohol) is parallel with the upper edge of the fin and extends completely down to the bases of the upper pectoral rays. *Julis maculata* Lesson is described with 6 dorsal spines, which either may be a typographical slip for 8 or an abnormality. Otherwise the imperfect account agrees.

Jouan describes *Labrus* No. 46, from Port de France, New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 269, 1861) which appears to be this species:

D. VIII, 13; A. II, 10. Body elongate, compressed, depth 3 in total. Head very small. Mouth little cleft. Lips wide. Interorbital equals eye. Scales large. Caudal rounded. Sombre green, with many vertical reddish streaks. Red lines oblique and longitudinal on head and belly. Dorsal and anal green, bordered red-lake, deep blue and orange. Caudal yellow, bordered above and below with red-lake and blue. Pectoral red, bordered with sky blue. Ventral blue. Length 90 mm.

Red Sea, Zanzibar, Mozambique, Natal, Mauritius, Bourbon, Seychelles, India, Ceylon, Siam, East Indies, Philippines, China, Queensland, Melanesia, Micronesia, Polynesia.

Thalassoma jansenii (Bleeker).

Julis jansenii Bleeker: Soc. Sci. Ind. Neerl., Act. (Manado), vol. 1, p. 56, 1856 (type loc., Manado, Celebes).—Günther: Cat. fishes Brit. Mus., vol. 4, p. 187, 1862 (Fiji; Aneiteum).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Viti Islands).—Günther: Cruise of "Curaçoa" (Brenchley), p. 410, 1873 (Solomons).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 275, 1883 (Engineer Group, New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 295, 1909 (Ponapé; New Hebrides; Fiji; Solomons; Lufu in Loyalty Islands).

Differs from *Thalassoma lunare* in the head without red bands. Back with 3 contrasted broad black blotches and caudal with blackish basal crescent. According to Bleeker reaches 165 mm.

In the National Museum 1 from Fiji, obtained by the Wilkes Expedition.

India, East Indies, Riu Kiu, Queensland, Melanesia, Micronesia, Polynesia.

Thalassoma umbrostigma (Rüppell) (Pl. XL, *A*).

Julis umbrostigma Rüppell: Neue Wirbelth., Fische, p. 11, pl. 3, fig. 2, 1835 (type loc., Mohila; Djedda, Red Sea).—Günther: Cat. fishes Brit. Mus., vol. 4, p. 185, 1862 (Aneiteum). [—Bleeker: Atlas ichth. Ind. Neerl., vol. 1, p. 92, pl. 34, fig. 2 (Java; Cocos Islands).] —Schmeltz: Mus. Godeffroy, Cat. 6, p. 16, 1877 (Pelew Islands; Tahiti).—Streets: U. S. Nat. Mus. Bull., no. 7, p. 83, 1877 (Fanning Islands).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 506, 1901 (1902) (Honolulu; Laysan).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 294, pl. 149, fig. B, 1909 (Pelew Islands, Ponapé, Mortlock, Ruk, Aneiteum, Marquesas, Kingsmills, Society Islands, Samoa, Rarotonga, Rotuma, Hawaii).—Regan: Zool. Soc. London, Proc., p. 371, 1913 (Easter Island).—Fuentes: Mus. Nac. Chile, Bolet., vol. 7, no. 1, p. 304, pl. 9, 1914 (Vaihou, Easter Island).

Thalassoma umbrostigma Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 463, 1902 (1903) (Honolulu).—Snyder: U. S. Fish Comm., vol. 22, p. 529, 1902 (1904) (Laysan).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 300, fig. 129, 1903 (1905) (Honolulu, Kailua, Hilo). —Jordan and Seale: Bur. Fish., Bull., vol. 25, p. 306, 1905 (1906) (Apia, Pago Pago).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 57, 1906 (Makatea, Paumotus).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 141, 1912 (La Perouse Bay, Easter Island).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 72, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 29, 1925 (Honolulu).— Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 24, 1925 (Wake, Necker, Laysan and Lisiansky islands).— Fowler: op. cit., Bull. 38, p. 25, 1927 (Washington, Fanning, Tongareva and Baker islands).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 325, 1928 (Fanning, Apia, Hawaii, Honolulu, Easter Island).

Julis souleyetii Valenciennes: Hist., nat. Poiss., vol. 13, p. 334, 1839 (type loc., Mauritius; "Ouaou," Hawaiian islands.)—Eydoux and Souleyet: Voyage "Bonite," Zool., vol. 1, p. 190, pl. 6, fig. 2, 1841.

Julis punctatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 91, 1901 (type loc., Agaña, Guam).

Thalassoma punctatum Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 57, 1906 (Rarotonga).

Thalassoma cyanogaster (non Valenciennes) Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 305, fig. 53, 1905 (1906) (Apia and Pago Pago, Samoa).

A handsome species easily known by its spotted and speckled head. In the young the sides with 2 series of more or less quadrate areas of dark spots.

The Agassiz Museum has 12 from La Perouse Bay on Easter Island, 9 Hawaiian specimens through Andrew Garrett, also 5 from the Kingsmill Islands and 4 from the Society Islands through the same, and 1 from Ebon Island, through Rev. B. G. Snow in 1877. In the Bishop Museum the types of *Julis punctatum* from Agaña on Guam, 17 from Honolulu, 1 from Max Schlemmer in August 1905, 4 Rarotonga, and 4 Makatea in the Tuamotus. I found but 1 in the Honolulu market, January 7, 1923.

Three from Wake Island, 1 Necker, 3 Laysan and 3 Lisianski in 1923. The National Museum has 1 from Maui and 1 from Oahu, obtained by the Wilkes Expedition. Also 5 Hawaiian specimens obtained by the *Albatross,* 37 from Cook's Bay on Easter Island, 3 from Apia, and 1 from Fanning Islands through T. H. Streets.

Red Sea, Natal, Mauritius, Bourbon, Seychelles, India, East Indies, Philippines, China, Melanesia, Micronesia, Polynesia, Hawaii.

Thalassoma purpureum (Forskål).

Scarus purpureus Forskål: Descriptiones animalium, pp. x, 27, 1775 (type loc., Djedda, Red Sea).

Julis purpurea Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 228, 1898 (Rota, Mariannes).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 91, 1900 (Agaña, Guam).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 292, pl. 149, fig. A, 1909 (Hawaiian islands, Society Islands, Rota).

Julis purpureus Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 506, 1901 (Honolulu, Laysan).

Thalassoma purpurea Waite: Australian Mus., Records, vol. 5, p. 3, 1903 (Nauru, Pleasant Island, Marshalls).

Thalassoma purpureum Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 462, 1902 (1903) (Honolulu).—Snyder: op. cit., p. 528, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 295, 1903 (1905) (Honolulu, Kailua, Hilo).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1399, 1906 (Upolu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 305, 1905 (1906) (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 302, 1911 (Whitsundy Island, Paumotus).—Kendall and Radcliffe: op. cit., vol. 35, p. 140, 1912 (Cook Bay, Easter Island).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 72, 1922 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 29, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 23, 1925 (Laysan, Lisiansky, Necker, Johnston and Wake islands).—Fowler: op. cit., Bull. 38, p. 25, 1927 (Fanning, Jarvis and Baker islands).

Julis quadricolor Lesson: Mus. Hist. Nat. Paris, Mem., vol. 4, p. 400, 1828 (type loc., Tahiti).—Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 139, pl. 35, fig. 1, 1830 (Tahiti; Matavai; Borabora).—Valenciennes: Hist. nat. Poiss., vol. 13, p. 324, 1839 (Tahiti).

Thalassoma quadricolor Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 462, 1902 (1903) (Hawaii).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 16, 20, 22, 1902 (1903) (Honolulu).—Snyder: U. S. Fish Comm., Bull., vol. 22, p. 528, 1902 (1904) (Honolulu).

Julis cyanogaster Valenciennes: Hist. nat. Poiss., vol. 13, p. 325, 1839 (type loc., Tahiti).

Labrus cyanogaster (Solander) Valenciennes: Hist. nat. Poiss., vol. 13, p. 325, 1839 (type loc., Tahiti) (name in synonymy).

Labrus vittatus (Forster) Valenciennes: Hist. nat. Poiss., vol. 13, p. 325, 1839 (type loc., Tahiti) (name in text).

Julis trilobata (part) Günther: Cat. fishes Brit. Mus., vol. 4, p. 187, 1862 (Aneiteum).

Thalassoma immanis Fowler: Acad. Nat. Sci. Philadelphia, p. 488, pl. 18, fig. 2, 1899 (type loc., Thornton Island [wrongly ascribed to the Carolines]).

Julis rüppellii (non Klunzinger) Steindachner: Akad Wiss. Wien, Denk., vol. 70, p. 506, 1901 (Laysan).

Thalassoma berndti Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 4, p. 115, fig. 7, 1901 (type loc., Honolulu).

Head 2 7/8 to 3 1/3; depth 3 to 3 2/5; D. VIII, 13, 1; A. III, 11, 1; scales 21 or 22, 4 or 5 in lateral line to caudal base and 1 or 2 more on latter; 3 or 4 scales above lateral line, 9 or 10 below; predorsal 8 or 9; snout 2 1/5 to 2 2/3 in head; eye 5 3/4 to 7 1/4; maxillary 2 7/8 to 4; interorbital 3 1/2 to 4 1/2.

Head width 1 5/6 to 2 1/10 its length. Eye small, elevated, hind edge midway in head. Lips broad, fleshy. Rictal groove back to eye. Pair of canines in front of each jaw, lower pair closer. Interorbital well elevated, strongly convex. Gill rakers 7 + 9, firmly lanceolate. 3 1/4 in gill filaments, which equal eye. Scales with 34 to 39 basal radiating striae, 34 to 38 apically. Tubes in lateral line arborescent, less so in young.

Brownish to dull olive-brown generally, paler below. Iris dull brown. Opercle slaty-gray and side of head with several obscure streaks and some dark spots on cranium. Trunk with 3 longitudinal pale bands, forming 2 series of oblong even blotches of dull brown, due to intersecting lines. Dorsals and anals gray brown, each with pale yellowish edges. Caudal double concave, ends pointed, brownish, more yellowish terminally. Pectoral pale brown basally, edge dusky and terminally slaty. Pectoral axil dusky-slate. Ventral pale brown.

In the Academy the type of *Thalassoma immanis* and a small specimen from Thornton Island, and 3 Hawaiian specimens. The National Museum has 1 from the Tuamotus, obtained by the Wilkes Expedition, 322 mm. long. Other records for the Wilkes Expedition are one from Lazuroff Island and 1 from Honden Island in August, 1839. Also an adult obtained by the *Albatross* at Cook's Bay on Easter Island, 1 Whitsunday Island, and 1 Honolulu. In the Bishop Museum the type of *Thalassoma berndti,* 393 mm. long, 14 from Honolulu, 1 from Tubuai, and 1 from Agaña, on Guam. Largest 431 mm. Five from Laysan, 1 from Necker, 1 Johnston Island and 1 Wake Island in 1923. In the Agassiz Museum 1 from Ebon Island, through Rev. B. G. Snow and 3 from Kingsmill Islands through Andrew Garrett.

Red Sea, Ceylon, Melanesia, Polynesia, Hawaii, Easter Island.

Thalassoma trilobata (Lacépède) (Pl. XL, *B*).

Labrus trilobatus Lacépède: Hist. nat. Poiss., vol 3, pp. 454, 526, pl. 4, fig. 3, 1802 (type loc., "The Great Equatorial Ocean" [Indo-Pacific]).

Julis trilobata Günther: Cat. fishes Brit. Mus., vol. 4, p. 187, 1862 (Aneiteum).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Samoa).—Günther: Cruise of "Curaçoa" (Brenchley), p. 410, 1873 (Solomons).—Peters: Akad. Wiss. Berlin, Monatsb., p. 843, 1876 (1877) (New Hannover).

Julis trilobatus Schmeltz: Mus. Godeffroy, Cat. 5, p. 34, 1874 (Samoa; Tahiti).

Thalassoma trilobata Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaiian islands).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 15, 29, 1925 (Guam; Honolulu).

Julis erythrogaster Valenciennes: Hist. nat. Poiss., vol. 13, p. 327, 1839 (type loc., Uléa).

Labrus erythrogaster (Solander) Valenciennes: Hist. nat. Poiss., vol. 13, p. 327 (type loc., Uléa) (name in text).

Labrus formosus (Forster) Valenciennes: Hist. nat. Poiss., vol. 13, p. 327 (type loc., Tahiti) (name in text).

Julis aran Thiollière: Fauna Woodlark, p. 196, 1857 (type loc., Woodlark Island).

Thalassoma purpureum (non Forskål) Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 510, 1900 (Hawaiian islands).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 462, 1902 (1903) (Hawaiian islands).—Jordan and Evermann: op. cit., vol. 23, pt. 1, pl. 34, 1903 (1905).

Julis purpureus Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 506, 1901 (1902) (Honolulu; Laysan).

Thalassoma fuscum (non Gmelin 1789) Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 299, 1903 (1905) (Honolulu; Kailua; Honuapo; Hilo).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 57, 1906 (Tubuai; Rarotonga).—Steindachner: Akad. Wiss. Wien., Sitz., vol. 115, pt. 1, p. 1399, 1906 (Samoa).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 306, 1905 (1906) (Apia).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 72, 1922 (Hawaii).

Julis fusca Günther: Mus. Godeffroy, Jour., vol. 8, pt 16, p. 293, pl. 146, fig. B, 1909 (Solomons, New Hebrides, Paumotus, Society Islands, Cook Islands, Tubuai, Samoa, New Hannover, Hawaiian islands).

Head 3 1/5 to 3 3/5; depth 3 1/4 to 3 2/3; D. VIII, 13, 1; A. II, 11, 1; scales 21 in upper section of lateral line followed by 4 or 5 to caudal base and 2 more on latter; 4 scales above lateral line, 10 or 11 below; 8 predorsal scales; snout 3 to 3 1/3 in head; eye 4 3/5 to 4 3/4; maxillary 3 2/3 to 4; interorbital 4 1/8 to 4 1/3. Head naked, width 2 1/3 to 2 3/5 its length. Tubes in lateral line trifid, branches moderately long. Dorsal spines all little lower than rays. Caudal convexly rounded behind. Dry skins faded brownish. Traces of blackish blotch at front of spinous dorsal. Length 122 to 127 mm.

In the Academy 3 Hawaiian specimens from J. K. Townsend, dry skins. The Bishop Museum has 6 from Rarotonga, 6 Honolulu, 1 Hilo and 1 from Makatea in the Tuamotus. I found a half-grown specimen in the Honolulu market December 21, 1922. Largest 240 mm. One from Guam in 1923. In the National Museum 2 Hawaiian specimens and 1 from Apia. The Agassiz Museum has 1 from Ponapé in the Carolines through Rev. L. H. Gulick, 1 from Ascension Island, through Rev. A. A. Strong in 1877, and 2 from the Society Islands through Andrew Garrett.

Zanzibar, Madagascar, Bourbon, Mauritius, Seychelles, East Indies, Melanesia, Micronesia, Polynesia, Hawaii.

Thalassoma lutescens (Lay and Bennett).

Julis lutescens (Solander) Lay and Bennett: Zool. Beechey's voyage, p. 65, pl. 19, fig. 2, 1839 (type loc., Tahiti; Riu Kiu).

Thalassoma lutescens Jordan and Snyder: (U. S.) Bur. Fish., Bull., vol. 26, p. 214, 1906 (1907) (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 38, p. 25, 1927 (Oahu).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 326, 1928 (Fanning, Honolulu).

Julis aneitensis Günther: Cat. fishes Brit. Mus., vol. 4, p. 183, 1862 (type loc., Aneiteum; Cato Island, northeast Australia; Norfolk Island).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Kandavu).—Schmeltz: op. cit., Cat. 5, p. 34, 1874 (Tahiti).—Streets: U. S. Nat. Mus., Bull., no. 7, p. 85, 1877 (Fanning Islands).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 290, 1909 (Ponapé, Samoa, Solomons, Aneiteum).

Julis anertensis Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 90, 1900 (Guam).

Thalassoma aneitense Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 943, 1904 (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 304, pl. 41, 1903 (1905) (same specimen).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 57, 1906 (Nukuhiva).—Fowler: B. P. Bishop Mus., Bull. 22, p. 29, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 24, 1927 (Johnston Island).

Thalassoma lunare (non Linné) Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 131, 1902 (1903) (Marcus Island).

Thalassoma lunaris Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 303, 1903 (1905) (Honolulu).

Thalassoma genivittata (non Valenciennes) Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 131, 1902 (1903) (Marcus Island).

Thalassoma duperreyi (non Quoy and Gaimard) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 57, 1906 (Mangareva).

Coris caudimaculatus (non Quoy and Gaimard) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 57, 1906 (Rarotonga).

Thalassoma neanis (Jordan and Evermann) Jordan and Snyder: (U. S.) Bur. Fish., Bull., vol. 26, p. 214, pl. 12, fig. 2, 1906 (1907) (type loc., Honolulu).

The Bishop Museum contains 4 from Mangareva, 3 Tubuai, 3 Nukuhiva, 4 from Agaña on Guam, 4 Marcus Island, and 1 Rarotonga. Largest 258 mm. One from Johnston Island in 1923. Although the cast of the specimen obtained in the Honolulu market is exhibited in the Bishop Museum, I could not locate the specimen from which it was made. The figure of *Thalassoma aneitense* by Jordan and Evermann is misleading, as it doubtless emphasizes the condition of preservation of the specimen. The pale or whitish spots shown on each scale correspond perfectly with alcoholic and formaline specimens I examined. The dark vertical lines, just as in *Thalassoma duperrey* and *Thalassoma lunare* are not mentioned or indicated at all. Also the caudal is greatly lunate, just as in the latter. I am obliged to consider the specimen described by Jordan and Evermann as *Thalassoma lunare* to be *Thalassoma lutescens,* even though they do not mention any black spot on the second membrane of the spinous dorsal. Now quite prominent and significant of *Thalassoma lunare* is the red blotch on the pectoral fin extending completely to the fin base and turning to black in alcoholic specimens. Its disposition is superior on the pectoral fin or comprising the upper part of that fin. Jordan and Evermann describe the "pectoral dark blue, almost black distally, the base orange." They say their specimen agrees with Bleeker's figure, but Bleeker does not show the pectoral base orange and there is every reason to contend that the upper half of it at least is red and would appear black as in my alcoholic specimen of *Thalassoma lunare.* In the National Museum the type of *Thalassoma neanis,* also an-

other Hawaiian specimen from Honolulu and 5 from the Fanning Islands. Small specimen from the Hawaiian islands in the Agassiz Museum received from Andrew Garrett.

Japan, Riu Kiu, northeast Australia, Queensland, Melanesia, Micronesia, Polynesia, Hawaii.

Thalassoma melanochir (Bleeker).

Julis (*Julis*) *melanochir* Bleeker: Soc. Sci. Ind. Neerl., Act. (Amboina), vol. 2, p. 77, 1857 (type loc., Amboina).—Bleeker: op. cit., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 72, pt. 1, p. 64, 1875 (west coast Mexico; Hawaii).—Streets: U. S. Nat. Mus., Bull., no. 7, p. 84, 1877 (Fanning Islands).

Julis melanochir Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Samoa).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 296, pl. 152, fig. B, 1909 (Hawaiian islands).

Thalassoma melanochir Waite: Australian Mus., Records, vol. 5, p. 3, 1903 (Nauru, Pleasant Island, Marshalls).

Head 3 2/5 to 3 1/2; depth 3 3/4 to 4 1/3; D. VIII, 13, 1; A. III, 11, 1; tubular scales 21, 4 in lateral line to caudal base and 2 more on latter; 4 scales above, 9 or 10 below, 8 predorsal; snout 3 2/3 to 3 7/8 in head; eye 4 2/3 to 5 1/3; maxillary 4 1/4 to 4 3/5; interorbitals 3 7/8 to 4.

Body strongly compressed, elongately fusiform, deepest near pectoral end, predorsal slightly trenchant. Caudal peduncle strongly compressed, length 4/5 its least depth, which 1 7/8 to 2 in head.

Head width 2 1/3 to 2 2/5 in its length. Snout conic, length 7/8 its width. Eye moderate, center at first third in head; diameter 1 1/5 to 1 1/4 in snout, 1 1/4 to 1 2/5 in interorbital. Mouth moderate, jaws equal. Maxillary largely concealed, reaches opposite hind nostril. Lips moderate. Teeth graduated smaller posteriorly, pair of canines in front of each jaw, none posterior. Front nostril at last third in snout; hind nostril close over front eye edge. Interorbital broadly convex. Gill rakers 4 + 12, lanceolate, 3 1/3 in gill filaments, which 1 1/4 in eye.

Scales with 36 to 38 basal radiating striae; apical 34 or 35; circuli very fine. Lateral line continuous; tubes with 3 main branches, sometimes several imperfect short ones about lowest branch. Dorsal spines pungent, eighth 3 1/8 to 3 3/5 in head; first dorsal ray 2 3/4; second anal spine 3 3/4 to 4 1/2; first anal ray 2 3/4 to 2 4/5; pectoral 1 1/4 to 1 1/3; ventral 2 to 2 2/5; caudal deeply emarginate, with upper and lower rays produced into slender points, 2 1/2 to 3 3/5 in combined head and trunk.

Brown, paler on under surface of head and abdomen. Each scale of back and side with vertical pale streak. Brown streak along side of snout and over postocular region horizontally to opercle angle; dark line across cheek down over lower side of head toward ventral origin. Fins brown, dorsals with narrow dark edge and upper and lower caudal edges slightly darker. Pectoral with black triangular basal blotch at origin and black subterminal blotch, largely parallel with hind edge for about 2/5 of fin. Length 112 to 140 mm.

In the Agassiz Museum 2 from the Society Islands, obtained by Andrew Garrett. One in the National Museum obtained by T. H. Streets at the Fanning Islands.

East Indies, Micronesia, Polynesia, Hawaii.

Thalassoma duperrey (Quoy and Gaimard).

Julis duperrey Quoy and Gaimard: Voyage "Uranie," Zool., p. 268, pl. 56, fig. 2, 1824 (type loc., Hawaiian islands).

Julis duperrei Valenciennes: Hist. nat. Poiss., vol. 13, p. 308, 1839 (Hawaii).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 506, 1901 (Honolulu; Laysan).

Julis duperreyi Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 291, pl. 148, figs. B-C, 1909 (Hawaii).

Thalassoma duperreyi Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 16, 19, 1902 (Honolulu).

Thalassoma duperrey Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 463, 1902 (1903) (Honolulu).—Snyder: op. cit., p. 529, 1902 (1904) (Honolulu, Puako Bay, between Maui and Molokai, Laysan).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 72, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 29, 1925 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 26, p. 23, 1925 (Laysan, French Frigates Shoal, Necker, Pearl and Hermes Reef).—Fowler: op. cit., Bull. 38, p. 25, 1927 (Honolulu and Howland).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 329, 1928 (Midway Reefs, type of *Julis clepsydralis*, Hawaii, Honolulu).

Julis melanoptera Streets: U. S. Nat. Mus., Bull., no. 7, p. 66, 1877 (Honolulu).

Julis clepsydralis Smith and Swain: U. S. Nat. Mus., Proc., vol. 5, p. 136, 1882 (type loc., Johnston Island).

Thalassoma pyrrhovinctum Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 51, fig. 7, 1899 (1900) (type loc., Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 18, 1902 (Honolulu).

Thalassoma aneitensis (non Günther) Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 510, 1900 (Hawaiian islands).

Thalassoma hebraica (non Lacépède) Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 510, 1900 (Hawaii).

Head 2 7/8 to 3 2/5; depth 3 1/4 to 3 2/5; D. VIII, 13, 1; A. II, rarely III, 11, 1; scales 21 to 23, 4 or 5 in lateral line to caudal base and 2 or 3 more on caudal base; 3 scales above lateral line, 8 or 9 below, 6 or 7 predorsal; snout 3 to 4 in head; eye 3 1/4 to 6 1/4; maxillary 3 4/5 to 4 1/4.

Young examples show a dark brown lateral band extending from snout tip through eye and ending in small dusky spot at middle of caudal basally; in width band greater than pupil, though less than eye, also may be broken in places. In larger examples only dark spot at snout end and on caudal base evident. Still larger specimens with dark spot at pectoral origin. In very small specimens fins all pale, though with age dorsals and anal darker.

The Academy has a series of 47 specimens, Hawaiian, mostly from Honolulu. Length 30 to 190 mm. In the Bishop Museum 22 from Honolulu, 2 young from Waikiki through C. H. Edmondson in 1922, 12 from Honomuni on Molokai through W. A. Bryan in July, 1914. I examined over 600 specimens in the Honolulu markets during November and December, 1922. W. A. Bryan also obtained 1 at Laysan in May, 1903. Largest specimen of this series 267 mm. Four from Laysan, 1 French Frigates Shoal, 1 Necker, 1 Lisianski, and 1 from Pearl and Hermes Reef in 1923. The National Museum has 1 from Maui, 1 Hilo and 3 Oahu collected by the Wilkes Expedition. Also series of about 74 Hawaiian specimens, mostly from Honolulu through the Bureau of Fisheries, 11 from Honolulu through T. H. Streets, 1 Fanning Islands, the type of *Julis clepsydralis*. The Agassiz Museum has 22

Hawaiian specimens from Andrew Garrett and 4 through the Bureau of Fisheries. Also 5 from Honolulu through W. H. Jones.

Thalassoma amblycephalus (Bleeker).

Julis (Julis) amblycephalus Bleeker: Nat. Tijds. Ned. Ind., vol. 11, p. 683, 1856 (type loc., Ord, Malang, in southeast Java).

Julis amblycephalus Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 374, 1897 (Rotuma Island).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 296, pl. 152, fig. C, 1909 (Ponapé; Huahine; Mortlock; Rotuma).

Greatly resembles *Thalassoma melanochir* but without the upper and lower caudal tips produced in long points.

Ceylon, East Indies, Micronesia, Polynesia.

Thalassoma ballieui (Vaillant and Sauvage) (Pl. XI., *C*).

Julis ballieui Vaillant and Sauvage: Rev. Mag. Zool., 3rd ser., vol. 3, p. 248, 1875 (type loc., Hawaiian islands).

Thalassoma baillieui Snyder: U. S. Fish Comm., Bull., vol. 22, p. 529, 1902 (1904) (Honolulu, Laysan).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 297, fig. 128, 1903 (1905) (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 72, 1922 (Hawaii).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 23, 1925 (French Frigates Shoal, Johnston, Laysan and Gardner islands).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 331, 1928 (Midway Reefs, type of *Julis verticalis*, Hawaii).

Julis obscura Günther: Rept. voyage "Challenger," vol. 1, p. 61, pl. 26, figs. A-B, 1880 (type loc., Honolulu).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 506, 1901 (Honolulu, Laysan).

Thalassoma obscurum Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 463, 1902 (1903) (Honolulu).

Julis verticalis Smith and Swain: U. S. Nat. Mus., Proc., vol. 5, p. 135, 1882 (type loc., Johnston Island).

Thalassoma verticale Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 15, 18, 1902 (Hilo; Honolulu).

The Bishop Museum has 11 from Honolulu, 2 Hilo, 1 Laysan through W. A. Bryan in 1903, and 1 from Agaña, Guam, through Alvin Seale, July 23, 1900. I examined 363 specimens in the Honolulu markets during November and December, 1922. The largest I have seen was 356 mm. long, though it is said to even atain to a slightly larger size. One from French Frigates Shoal, 1 Johnston Island, 2 Laysan, and 3 Gardner Island in 1923. The National Museum has 1 from Maui, 1 Oahu and 1 Hilo, obtained by the Wilkes Expedition. Also the type of *Julis verticalis*, 5 from Honolulu and 2 Hawaiian. In the Agassiz Museum 10 from the Society Islands through Andrew Garrett, 6 Hawaiian from the same donor, 2 from Honolulu through W. H. Jones and 1 Hawaiian through the Bureau of Fisheries.

Pseudolabrus inscriptus (Richardson).

Labrus inscriptus Richardson: Voyage "Erebus" and "Terror," ichth., p. 134, pl. 56, figs. 1-2, 1844-48 (type loc., Norfolk?; Polynesia?).

Tautoga inscripta Richardson: Voyage "Erebus" and "Terror," ichth., p. 134, 1844-48.

Pscudolabrus inscriptus Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 137, pl. 5, fig. 2; pl. 6, fig. 1, 1912 (Easter Island).

Labrichthys fuentesi Regan: Zool. Soc. London, Proc., p. 371, pl. 58, fig. 2, 1913 (type loc., Easter Island).—Fuentes: Mus. Nac. Chile, Bolet., vol. 7, no. 1, p. 304, pl. 7, fig. 2 (Vaihou, Easter Island).

Head 2 3/4 to 3; depth 3 1/10 to 3 2/5; D. IX, 11, 1; A. III, 10, 1; scales 21, 3 in lateral line to caudal base and 2 more on latter; 3 scales above, 8 or 9 below, 6 or 7 predorsal; snout 3 1/10 to 3 1/5 in head; eye 4 to 4 1/2; maxillary 3 1/4 to 4 1/3; interorbital 4 3/4 to 5.

Body compressed, elongately fusiform, deepest near vent, predorsal slightly trenchant. Caudal peduncle well compressed, length 2/3 its least depth, which 2 1/8 to 2 2/5 in head.

Head width 2 4/5 to 2 7/8 in its length. Snout conic, upper profile slightly convex, width 1 1/2 in its length. Eye with hind edge slightly behind middle in head length; diameter 1 1/3 in snout, greater than interorbital. Mouth rather small, jaws subequal. Lips fleshy, with longitudinal plicae. Teeth conic, graduated smaller posteriorly, pair of canines in each jaw in front; small detached canine on each maxillary, largely concealed. Front nostril about last 2/5 in snout; hind nostril little nearer eye than front nostril. Interorbital broadly convex. Gill rakers 3 + 12, lanceolate, short, longest 1/3 of gill filaments, which 2 in eye.

Scales with 17 basal radiating striae; apical 10 to 12; circuli fine. Tubes of lateral line terminally bifurcate. Ninth dorsal spine 2 1/3 to 2 2/3 in head; tenth dorsal ray 2 2/5 to 2 3/5; third anal spine 2 7/8; third anal ray 2 1/8 to 2 1/3; caudal 1 1/3 to 1 2/5, rounded convexly behind; pectoral 1 2/5 to 1 3/5; ventral 1 7/8 to 1 9/10.

Largely uniform brown, lower surface but little paler and some silvery tints on opercles. Brown line each side of snout above and another below, both to eye; 3 brown lines extend back from eye on postocular. Along back, above lateral line, 5 clusters of several small round black spots. Along side below lateral line 5 rows of vertical whitish bars. Black blotch at front of spinous dorsal over 2 membranes. Across pectoral base dusky-brown bar and fin base otherwise pale to whitish. Length 52 to 61 mm.

In the Agassiz Museum 2 specimens from Easter Island, obtained by the *Albatross*. Two in the National Museum from Easter Island.

Gomphosus varius Lacépède.

Gomphosus varius Lacépède: Hist. nat. Poiss., vol. 3, pp. 100, 104, pl. 5, fig. 2, 1802 (type loc., Tahiti).—Günther: Cat. fishes Brit. Mus., vol. 4, p. 193, 1862 (Aneiteum; Tahiti).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Viti Islands).—Schmeltz: op. cit., Cat. 5, p. 34, 1874 (Samoa; Viti Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 275, 1883 (Hula, Hood Bay, New Guinea).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 102, pt. 1, p. 238, 1893 (New Hebrides).—Elera: Cat. fauna Filipinas, vol. 1, p. 557, 1895 (Mariannes).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma Island).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 510, 1900 (Hawaiian islands).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 507, 1901 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 464, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 529, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 289, fig. 125, 1903 (1905) (Honolulu; Kailua; Hilo).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1398, 1906 (Upolu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 307, 1905 (1906) (Apia).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 298, pl. 147, fig. B, 1909 (Fiji; Ponapé).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 71, 1922 (Hawaii).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 23, 1925 (French Frigates

Shoal, Laysan).—Fowler and Bean: U. S. Nat. Mus., no. 100, p. 332, 1928 (type of G. *undulatus*, Hawaii, Honolulu, Apia).

Gamphosus varius Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).

Gomphosus pectoralis Quoy and Gaimard: Voyage "Uranie," Zool., p. 282, 1824 (type loc., Hawaii).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, pp. 93, 16, 17, 20 (Guam; Honolulu).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 298, pl. 147, fig. C, 1909 (Rotuma).

Gomphosus fuscus Valenciennes: Hist. nat. Poiss., vol. 14, p. 19, 1839 (type loc., Mauritius; Tahiti; Hawaii).

Gomphosus undulatus Streets: U. S. Nat. Mus., Bull., no. 7, p. 85, 1877 (type loc., Fanning Islands).

Head 2 1/3 to 2 3/5; depth 3 3/4 to 3 7/8; D. VIII, 13, 1; A. III, 11, 1; scales 27 in lateral line to caudal base and 2 more on latter; 3 scales above lateral line, 8 or 9 below; 7 to 9 predorsal scales; snout 1 3/4 to 2 in head; eye 7 to 8 1/4; maxillary 2 1/5 to 2 1/3, concealed; interorbital 6 to 7.

Head width 3 1/3 to 3 7/8 in its length. Snout elongated, conic, width 3 1/4 to 3 4/5 its length. Eye with front edge very slightly behind middle in head length, more so in adult. Teeth little enlarged in front of jaws though none canine-like. Interorbital slightly convex, with slight depression medianly. Gill rakers 8 + 17, lanceolate, short, firm, 1/3 of gill filaments, which 1 2/5 in eye. Scales with 31 to 46 basal striae, apical 19 to 31. Tubes of lateral line slender, with 1 to 3 branchlets. Caudal convexly rounded behind. Dull brown, little paler below. Head and breast pale. Each body scale with small dusky or blackish basal spot. Dusky streak through eye, sometimes doubled behind. Fins all dusky to blackish, extreme tips of dorsal and anal rays slightly whitish, also hind caudal edge rather widely. Pectoral and ventral pale brown, with small dusky spot at origin of former. Length 125 to 183 mm.

Three Hawaiian specimens in the Academy. The Bishop Museum has 19 from Honolulu, 1 from Honomuni on Molokai obtained by W. A. Bryan in July, 1914, and 5 from Guam. Largest 273 mm. One from French Frigates Shoal in 1923. In the National Museum 3 Apia, 4 Honolulu, 2 Hawaiian and the type of *Gomphosus undulatus* from Fanning Islands. In the Agassiz Museum 1 Kusaie in the Caroline Islands from Rev. B. G. Snow, and the following from Andrew Garrett, in Hawaii 5, and 1 Society Islands.

Red Sea, East Africa, Natal, Madagascar, Mauritius, Ceylon, Andamans, East Indies, Riu Kiu, Japan, Micronesia, Melanesia, Polynesia, Hawaii.

Gomphosus tricolor Quoy and Gaimard.

Gomphosus tricolor Quoy and Gaimard: Voyage "Uranie," Zool., p. 280, pl. 55, fig. 2, 1824 (type loc., Hawaiian islands).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Samoa).—Günther: Rept. voyage "Challenger," vol. 1, p. 58, 1880 (Tahiti harbor).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 275, 1883 (Pitt Bay, Moresby Island, New Guinea).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 510, 1900 (Hawaiian islands).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 93, 1900 (Guam).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 506, 1901 (Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 15, 16, 17, 19, 20, 1902 (Hilo; Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 464, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 529, 1902 (1904) (Honolulu; Puako Bay).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 290, pl. 36, 1903 (1905) (Honolulu; Hilo).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 58, 1906 (Mangareva; Rarotonga).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 307, 1905 (1906) (Apia; Pago Pago).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 297, 1909 (Mortlock; Hawaii).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 71, Dec. 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 29, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 23, 1925 (Johnston Island).—Fowler and Bean: U. S. Nat. Mus., no. 100, p. 333, 1928 (Hawaii, Apia, Puako Bay, Hilo, Honolulu).

Gomphosus cepedianus Valenciennes: Hist. nat. Poiss., vol. 14, p. 14, pl. 390, 1839 (type loc., Hawaiian islands; Caroline Islands; Tahiti).

Gomphosus sandvicensis Günther: Cat. fishes Brit. Mus., vol. 4, p. 194, 1862 (type loc., Hawaii).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 299, 1909 (type).

Amanses sandwichensis Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 17, 1902 (Honolulu).

Gomphosus sandwichensis Jordan and Snyder: (U. S.) Bur. Fish., Bull., vol. 26, p. 215, 1906 (1907) (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 71, 1922 (cast in Bishop Museum).

Gomphosus pacificus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 94, 1900 (type loc., Guam).

Head 2 1/4 to 2 1/3; depth 3 3/4 to 4; D. VIII, 13, 1; A. III, 11, 1; scales 21, 5 in lateral line to caudal base and 2 more on latter; 3 or 4 scales above lateral line, 9 below, 8 predorsal; snout 1 4/5 to 1 9/10 in head; eye 8 to 10; maxillary 2 to 2 1/10, concealed; interorbital 6 1/4 to 6 7/8. Gill rakers 9 + 16. Scales with 37 to 44 basal striae, apical 24 to 31. Dusky brown, with greenish tinge in fresh examples, base of each scale with dark blue spot. White bar above pectoral base close to and along edge of gill opening above. Vertical fins pale yellowish, with upper and lower caudal edges dark brown. Pectoral blackish terminally, with broad deep blue submarginal band and base yellowish. Small dark spot at pectoral origin. Iris dull brown.

The Academy has 9 specimens, of which 2 obtained by J. K. Townsend, the others mostly from Honolulu. Length 167 to 230 mm. In the Bishop Museum 29 from Honolulu, 1 Hilo, 3 Guam, 2 Mangareva, 1 Rarotonga. Largest 288 mm. Also the type of *Gomphosus pacificus*, which does not differ in any way from the Hawaiian series. In alcohol at present it shows the terminal unscaled half of the caudal whitish, besides the dorsals and anals broadly whitish marginally. Two from Johnston Island in 1923. The National Museum has 2 from Tahiti obtained by the Wilkes Expedition. Others, mostly through the Bureau of Fisheries, are 3 from Honolulu, 1 Hilo, 1 Puako Bay, 4 others Hawaiian, 2 Apia, and 1 from Amakarrina Island through Captain J. Rodgers. The Agassiz Museum has 1 from Honolulu through W. H. Jones in 1874, 2 from Maui through C. F. Winslow, 1 Hawaiian, and 1 Society Islands through Andrew Garrett.

East Indies, China, Japan, Micronesia, Polynesia, Hawaii.

Cheilio inermis (Forskål).

Labrus inermis Forskål: Descriptiones animalium, p. 34, 1775 (type loc., Moccha, Red Sea).

Cheilio inermis Günther: Cat. fishes Brit. Mus., vol. 4, p. 194, 1862 (Aneiteum).—Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Viti Islands).—Schmeltz: op. cit., Cat. 5, p. 34, 1874 (Tahiti).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 588, 1882 (New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 94, 1900 (Guam).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 511, 1900 (Hawaiian islands).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 462, 1902 (1903) (Honolulu).—Snyder: op. cit., p. 528, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 314, pl. 33, 1903 (1905) (Honolulu; Hilo).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 658, 1906 (Tahiti).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 304, 1905 (1906) (Apia).—Günther: Mus. Godeffroy. Jour., vol. 8, pt. 16, p. 283, 1909 (Hawaiian islands).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 139, 1912 (Cook Bay, Easter Island).—Regan: Zool. Soc. London, Proc., p. 371, 1913 (Easter Island).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 130 (Saonek, Waigiu).—Fuentes: Mus. Nac. Chile, Bolet., vol. 7, no. 1, p. 302, pl. 8, fig. 1, 1914 (Easter Island).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 71, Dec. 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 15, 29, 1925 (Guam; Honolulu).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 335, 1928 (Honolulu, Apia, Oahu, Hawaii, Easter Island).

Chilio inermis Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 507, 1901 (Honolulu).

Cheilio auratus Quoy and Gaimard: Voyage "Uranie," Zool., p. 274, pl. 54, fig. 2, 1824 (type loc., Hawaiian islands).—Valenciennes: Hist. nat. Poiss., vol. 13, p. 249, 1839 (Hawaiian islands).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).

Cheilio hemichrysos Valenciennes: Hist. nat. Poiss., vol. 13, p. 257, 1839 (type loc., Hawaiian islands).

Cheilio viridis Valenciennes: Hist. nat. Poiss., vol. 13, p. 258, 1839 (type loc., Vanicolo).

Cheilio udanad Thiollière: Fauna Woodlark, p. 192, 1857 (type loc., Woodlark Island).

Brosmius udanad (Montrouzier) Thiollière: Fauna Woodlark, p. 192, 1857 (name in synonymy).

The Bishop Museum has 30 from Honolulu, 1 Laie on Oahu on November 5, 1922, through C. Montague Cooke, Jr., and C. Montague Cooke III, 1 Hilo, 1 Guam, 1 Tahiti. I examined 105 specimens in the Honolulu markets in November and December, 1922, and January, 1923. Two from Guam in 1923. The National Museum has 2 Hawaiian, 5 Oahu and 3 Maui, obtained by the Wilkes Expedition. Other materials 18 Hawaiian of which 11 from Honolulu, 2 Apia and 2 Cooke's Bay on Easter Island. The Agassiz Museum has 1 from Oahu through H. Mann, 3 Hawaiian, of which 1 from Andrew Garrett, 10 Honolulu through W. H. Jones, 5 Society Islands also through Andrew Garrett, 3 Ebon Island from Rev. B. G. Snow, and 1 Ponapé in the Carolines from Rev. L. H. Guilck. Largest 407 mm. The Academy has 6 Hawaiian specimens, of which 1 from J. K. Townsend and 3 from Oahu through W. H. Jones.

Red Sea, Zanzibar, Mozambique, Natal, Madagascar, Mauritius, East Indies, Philippines, Formosa, China, Riu Kiu, Queensland, Melanesia, Micronesia, Polynesia, Hawaii, Easter Island.

Cirrhilabrus solorensis Bleeker.

Cirrhilabrus solorensis Bleeker: Nat. Tijds. Ned. Ind., vol. 5, p. 88, 1853 (type loc., Lawajong, Solor).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 272, 1883 (Pitt Bay, New Guinea).

Cirrhilabrus jordani Snyder: U. S. Fish Comm., Bull., vol. 22, p. 529, pl. 10, fig. 18, 1902 (1904) (type loc., between Maui and Lanai in 28 to 43 fathoms).

A small pale reddish labroid, anal edged black, few scattered white spots on back and 3 light longtitudinal streaks along lower side. Single row of large scales on cheek. Preopercle edge finely serrated.

One in the National Museum obtained by the Wilkes Expedition at Maui. Also type of *Cirrhilabrus jordani* obtained by the *Albatross* in 1902.

Pseudocheilinus hexataenia (Bleeker).

Cheilinus hexataenia Bleeker: Soc. Sci. Ind. Neerl., Act. (Amboina), vol. 2, p. 84, 1857 (type loc., Amboina).—Bleeker: op. cit., no. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).

Pseudocheilinus hexataenia Schmeltz: Mus. Godeffroy, Cat. 5, p. 33, 1874 (South Sea).—Streets: U. S. Nat. Mus., Bull., no. 7, p. 631, 1877 (Honolulu).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 250, 1881 (Society Islands, Samoa, Phoenix Group).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 521, 1900 (Tahiti).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1398, 1906 (Samoa).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 311, pl. 44, fig. 2, 1905 (1906) (Apia).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 614, 1908 (Suva, Fiji).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 35, 38, 1925 (Samoa; Tahiti).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 24, 1925 (Johnston and Wake islands).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 335, 1928 (Hawaii, Honolulu, Apia, Oahu, Tahiti, type of *P. evanidus*).

Pseudocheilinus psittaculus Kner and Steindachner; Akad. Wiss. Wien, Sitz., vol. 54, pt. 1, p. 376, fig. 7, 1866 (type loc., Phoenix Islands).

Pseudocheilinus psittacula Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Mackean Islands; Viti Islands: Samoa).

Pseudocheilinus octotaenia Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 64, fig. 22, 1899 (1900) (type loc., Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 16, 1902 (Honolulu).—Jenkins: U. S. Fish Comm., vol. 22, p. 464, 1902 (1903) (Honolulu).—Snyder: op. cit., p. 530, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 317, pl. 37, fig. 135, 1903 (1905) (Honolulu; Hilo).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 73, 1922 (Hawaii).

Pseudocheilinus evanidus Jordan and Evermann: op. cit., vol. 22, p. 192, 1902 (1903) (type loc., Henshaw's pool near Hilo, Hawaii).—Snyder: op. cit., p. 530, 1902 (1904) (Hawaiian islands).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 317, pl. 43, 1903 (1905) (type).

Halichoeres trimaculatus (non Quoy and Gaimard)

Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 56, 1906 (Raiatea).

Head 2 1/2 to 2 3/4; depth 2 3/5; D. IX, 11, 1; A. III, 9, 1; scales 17 or 18 in upper section of lateral line, 3 or 4 in lower and 2 more on caudal base; 2 scales above lateral line, 6 below; 5 predorsal scales; snout 3 1/4 to 3 2/5 in head; eye 3 1/5 to 3 1/4; maxillary 3 1/2 to 4; interorbital 4 to 4 1/4.

Head width 2 1/5 to 2 1/3 in its length. Snout conic, width 1 1/3 to 1 1/6 in its length. Canines 4 above, also with larger curved one externally each side flaring out laterally and pair of canines in front of lower jaw. Interorbital broadly convex. Gill rakers 1+4, short lanceolate points, 1/3 of gill filaments, which 1/3 of eye. Scales with basal radiating striae 10 to 13, apical 20 to 25.

Largely brownish above, little paler on head below, breast and abdomen. From above pectoral base, following at junctures of scales, 7 longitudinal pale or grayish lines. Small dusky spot, clearly defined, edged narrowly grayish, at bases of upper caudal rays, less than half of pupil in size. Iris brown, crossed by 2 longitudinal pale lines. Lower surface of head finely and thickly dotted with whitish. Upper surface of head, most all of vertical fins, at least basally and ventral, bluish-green. Length 34 to 44 mm.

In the Academy 7 from Tahiti, obtained by Andrew Garrett. The Bishop Museum has 11 from Honolulu, 1 Raiatea, 1 from Palmyra obtained by C. Montague Cooke, Jr., in 1913, and another from the same locality through Thurston and Thaanum in 1922. Largest specimen 113 mm. Six from Johnston Island and 1 from Wake Island in 1923. The National Museum has 1 from Maui, obtained by the Wilkes Expedition, the type of *Pseudocheilinus evanidus*, 21 Hawaiian specimens from the Bureau of Fisheries, 1 from Honolulu through T. H. Streets and 5 from Apia. In the Agassiz Museum 9 from the Society Islands and 2 Hawaiian, all obtained by Andrew Garrett.

None of the nominal species included above show any structural characters of distinction and the color-patterns are untrustworthy. While Bleeker shows but 6 pale lines, Jenkins shows 7 narrow dark longitudinal lines. Jordan and Seale give a colored figure which shows distinctly 7 pale or orange longitudinal lines.

Red Sea, Madagascar, East Indies, Polynesia, Hawaii.

Cheilinus bimaculatus Valenciennes.

Cheilinus bimaculatus Valenciennes: Hist. nat. Poiss., vol. 14, p. 71, 1839 (type loc., "Onarourou," Hawaiian islands).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 16, 19, 20, 1902 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 464, 1902 (1903) (Honolulu).—Snyder: op. cit., p. 530, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 320, pl. 38, 1903 (1905), (Honolulu; Hilo).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 73, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 29, 1925 (Honolulu).

Chilinus bimaculatus Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 504, 1901 (Honolulu).

Cheilinus ceramensis Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 290, 1852 (type loc., Wahai, northern Ceram).—Günther: Cat. fishes Brit. Mus., vol. 4, p. 127, 1862 (Aneiteum).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 245, 1881 (Aneiteum specimen).

Head 2 2/5 to 2 1/2; depth 2 2/3 to 2 4/5; D. IX, 10, 1; A. III, 8, 1; scales 15 or 16 in upper section of lateral line, 4 to 7 in lower section to caudal base and 2 more on latter; 2 scales above lateral line, 6 below, 6 predorsal; snout 3 1/6 to 3 1/5 in head; eye 4 1/8 to 4 4/5; maxillary 2 3/4 to 3; interorbital 4 1/3 to 4 4/5. Color variable and young pale.

In the Academy 3 Hawaiian specimens 100 to 123 mm. The National Museum has 4 obtained by the Wilkes Expedition at Maui. Also 2 Hawaiian and 1 Honolulu through the Bureau of Fisheries. The Bishop Museum has 28 from Honolulu and 1 from Hilo. I found only a single specimen in the Honolulu market during December, 1922. The Agassiz Museum has 3 Hawaiian specimens.

Kittlitz mentions 3 small species from Lugunor, all simply names, as *Cheilinus signatus*, *Cheilinus aspersus* and *Cheilinus reticulatus* (Denkw. Reise Mikronesien, vol. 2, p. 113, 1858). These are mentioned simply for completeness.

East Indies, Hawaii.

Cheilinus oxycephalus Bleeker.

Cheilinus oxycephalus Bleeker: Nat. Tijds. Ned. Ind., vol. 5, p. 349, 1853 (type loc., Amboina).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 33, 1874 (South Sea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 276, 1883 (southeast New Guinea).

Head 2 2/3; depth 2 1/3; D. X, 9, 1; A. III, 8, 1; scales 15 in upper section of lateral line, 7 in lower section to caudal base and 1 more on latter; 2 above, 6 below, 6 predorsal; snout 3 1/8 in head; eye 6; maxillary 3; interorbital 4 1/5.

Body oblong, ovate, well compressed, predorsal with median keel. Caudal peduncle compressed, length 3/5 its least depth which 2 1/6 in head.

Head width 2 1/5 in its length. Snout conic, width 1 1/5 in its length. Eye small, hind edge midway in head length; diameter 1 4/5 in snout, 1 1/3 in interorbital. Mouth small, lower jaw slightly protruded. Maxillary not quite reaching eye. Lips fleshy, inner surfaces plaited. Teeth conic, uniserial, with pair of canines in front of each jaw; several other small, short inner teeth in each jaw anteriorly. Front nostril at last fourth in snout; hind nostril higher, closer to front nostril than eye. Interorbital convex. Gill rakers 6+8, lanceolate, 2 in gill filaments, which 1 2/3 in eye.

Scales with 23 to 26 basal radiating striae; apical striae 38 to 43; circuli very fine. Cheek with 2 rows of scales with 3 scales in lower row. Tenth dorsal spine 2 2/3 in head; fifth dorsal ray 2; third anal spine 2 1/3; first anal ray 2; caudal 1 2/5, hind edge convexly rounded; pectoral 1 7/8; ventral 1 1/2.

Uniform dusky-brown, with olivaceous tinge. Soft vertical fins mottled with pale gray spots and dark marblings. Many of scales with small black dot at base of each. Traces of 3 median lateral dusky blotches. Each dorsal spine with several dark spots. Soft vertical fins mottled with pale gray spots and dark marblings. Pectoral pale olivaceous. Ventral dusky, with some fine blue-gray dots. Length 176 mm.

One in the Agassiz Museum from the Society Islands, obtained by Andrew Garrett.

East Indies, Philippines, Polynesia.

Cheilinus trilobatus Lacépède.

Cheilinus trilobatus Lacépède: Hist. nat. Poiss., vol. 3, pp. 527, 537, pl. 31, fig. 3, 1802 (type loc., Reunion; Mauritius; Madagascar).—Günther: Cat. fishes Brit. Mus., vol. 4, p. 126, 1862 (Aneiteum).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Samoa).—Schmeltz: op. cit., Cat. 5, p. 33, 1874 (Tahiti).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 586, 1882 (New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 85, 1900 (Guam).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 322, 1903 (1905) (Pago Pago).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 59, 1906 (Tubuai; Faté; Mangareva; Tahiti).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1397, 1906 (Upolu; Savaii).—Jordan and Seale: (U. S.) Bur. Fish., vol. 25, p. 308, 1905 (1906) (Apia; Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 22, 1925, p. 15 (Guam), p. 35 (Samoa).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 347, 1928 (Pago Pago, Apia).

Chilinus trilobatus Günther: Rept. voyage "Challenger," vol. 1, p. 36, 1880 (Levuka, Fiji).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 244, pl. 131, 1881 (Fiji; New Hebrides; Samoa; Society Islands; Kingsmills; Howland; Ponapé; Futuna).—Waite: Australian Mus., Mem., no. 3, p. 192, 1897 (Funafuti, Ellice Islands).

Cheilinus sinuosus Quoy and Gaimard: Voyage "Uranie," Zool., p. 278, 1824 (type loc., Hawaiian islands; Madagascar).—Valenciennes: Hist. nat. Poiss., vol. 14, p. 70, 1839 (Hawaiian islands; Mariannes).

Cheilinus rivulatus Valenciennes: Hist. nat. Poiss., vol. 14, p. 63, 1839 (type loc., New Ireland).

Cheilinus polygramma Valenciennes: Hist. nat. Poiss., vol. 14, p. 76, 1839 (type loc., Uléa).

Cheilinus maculosus Valenciennes: Hist. nat. Poiss., vol. 14, p. 77, 1839 (type loc., Oualan).

Cheilinus pulchellus Sauvage: Soc. Philom. Paris, Bull., 7th ser., vol. 4, p. 224, 1879 (type loc., Fiji).

Head 2 3/5 to 2 2/3; depth 2 1/3 to 2 2/5; D. IX, 11, 1; A. III, 8, 1; scales 15 or 16 in upper arch of lateral line, 7 to 9 in lower arch to caudal base and 2 more on latter; 2 scales above lateral line, 6 below; 6 predorsal scales; snout 2 3/4 to 3 1/10 in head; eye 6 to 6 1/2; maxillary 3 1/8 to 3 1/5; interorbital 4 to 4 1/10.

Head width 2 1/8 in its length. Snout conic, upper profile little concave, length equals its width. Hind eye edge slightly before middle in head length. Teeth conic, uniserial, pair of canines forward in each jaw, lower closer. Interorbital convex. Gill rakers 4+6, short, firm, conic, 2 1/4 in gill filaments, which 1 3/5 in eye. Scales with 14 to 20 basal radiating striae, apical 44 to 63. Cheek with 2 rows of scales of 3 scales in each row, not covering flange. Tubes in lateral line simple, slender, with 1 or 2 small short branchlets. Caudal convex, with slight traces of upper and lower points in larger examples. Largely dull uniform brownish, each body scale with obscure pale vertical line. Head with lines, bars and dots of paler, many obliquely forward from eye to mouth and at least 4 extending forward from eye. Dorsals pale brownish, tinged dull greenish basally and with submarginal dull brown line. In smaller example dorsals quite pale, especially soft fin, basally slaty or dusky. Caudal dull olive, membranes slaty. Caudal peduncle with pair of dull brownish saddles above and another pair below. Anal brownish, rays dull greenish. Pectoral pale or dull brown. Ventral greenish, dusky terminally. Length 158 to 228 mm.

Two in the Academy from Pago Pago. The Bishop Museum has 1 from Tahiti, 2 Mangareva, 1 Guam, 1 Faté. Largest 270 mm. Two from Guam in 1923. In the National Museum 1 from New Guinea, 8 Apia and 1 Pago Pago. In the Agassiz Museum 2 Pago Pago, 2 Society Islands from Andrew Garrett, also the following from the same, 3 Kingsmills and 2 "Hawaiian islands"; 1 from Ebon Island, obtained by Rev. B. G. Snow; 3 from Ponapé, through Rev. L. H. Gulick.

Cheilinus pulchellus Sauvage is a synonym, based on a small specimen 180 mm. Possibly *Julis* described by Jouan (Soc. Cherbourg, Mem., vol. 8, p. 270, 1861) from Port de France, New Caledonia, is this species: D. IX, 11; A. II, 11. Depth 2 4/5 in total. Lateral line interrupted. Large scales violet, with brown and blue lines. Teeth rose-purple. Large eyes bordered deep blue. Caudal rounded, green, edge purple. Pectoral colorless, first ray pale blue. Ventral red with blue. Length 300 mm.

Red Sea, Zanzibar, Madagascar, Bourbon, Reunion, Mauritius, Seychelles, India, East Indies, Philippines, China, Riu Kiu, Japan, Melanesia, Micronesia, Polynesia.

Cheilinus fasciatus (Bloch).

Sparus fasciatus Bloch: Nat. ausländischen Fische, vol. 5, p. 18, pl. 257, 1791 (type loc., Japan).

Labrus fasciatus Kittlitz: Denkw. Reise Mikronesien, vol. 2, pp. 160, 181, 1858 (Uléa; Bonin Islands).

Cheilinus fasciatus Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, 1859 (Doreh, New Guinea).—Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 299, 1868 (Waigiu).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Samoa).—Günther: Cruise of "Curaçoa" (Brenchley), p. 410, 1873 (Solomons).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 586, 1882 (New Guinea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 276, 1883 (southeast New Guinea).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 35, 1885 (Rubi, New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 86, 1900 (Agaña, Guam).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 58, 1906 (Faté; Shortland Island; Cook Islands).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 308, 1905 (1906) (Pago Pago; Apia).—Fowler: Bishop Mus., Bull. 22, p. 35, 1925 (Samoa).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 350, 1928 (Apra Bay on Guam, Pago Pago).

Chilinus fasciatus Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 246, pl. 134, 1881 (Solomons; Pelew Islands; Kingsmills; Vavau; Ponapé).—Waite: Australian Mus. Mem., no. 3, p. 193, 1897 (Funafuti, Ellice Islands).

Cheilinus quinquecinctus Rüppell: Neue Wirbelth. Fische, p. 19, pl. 6, fig. 1, 1835 (type loc., Djedda, Red Sea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (South Sea).

Sparus zonephorus Kittlitz: Denkw. Reise Mikronesien, vol. 2, p. 160, 1858 (Uléa).

Cheilinus nigropinnatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 7, no. 3, p. 86, 1900 (type loc., Guam).

Thalliurus chlorurus (non Bloch) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 58, 1906 (Faté).

Head 2 1/2 to 2 3/5; depth 2 1/2 to 2 3/4; D. IX, 10, 1; A. III, 8, 1; scales 14 or 15 in upper section of

lateral line, 5 in lower section to caudal base and 3 more on latter; 2 scales above lateral line, 6 below; 8 or 9 predorsal scales; head width 1 7/8 to 2 in its length; first dorsal spine 4 1/5 to 5; seventh dorsal ray 2 1/4 to 2 3/5; second anal spine 2 2/5 to 3; fifth anal ray 2 1/4 to 2 1/2; least depth of caudal peduncle 2 3/5 to 2 7/8; caudal 1 3/5 to 1 7/8; pectoral 1 2/3 to 1 4/5; ventral 2 to 2 1/8. Length 75 to 79 mm.

Type and 2 paratypes of *Cheilinus nigropinnatus* from Guam, in the Bishop Museum. Also 2 from Rarotonga, 1 Faté, 2 Shortland Island and 1 Agaña on Guam. The National Museum contains 1 specimen labelled "Maui" though Manila according to a drawing, obtained by the Wilkes Expedition. Through the Bureau of Fisheries 17 Samoan specimens, of which 6 from Pago Pago. The Agassiz Museum has 3 from the Kingsmill Islands obtained by Andrew Garrett, and 1 from Ebon Island through Rev. B. G. Snow. The Academy has 6 from Pago Pago.

Red Sea, Mauritius, Seychelles, India, East Indies, Philippines, Riu Kiu, Japan, Melanesia, Micronesia, Polynesia.

Cheilinus undulatus Rüppell.

Cheilinus undulatus Rüppell: Neue Wirbelth. Fische, p. 20, pl. 6, fig. 2, 1835 (type loc., Djedda, Red Sea).—Streets: U. S. Nat. Mus., Bull., no. 7, p. 82, 1877 (Fanning Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 586, 1882 (New Guinea).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 309, 1905 (1906) (Pago Pago).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 303, 1911 (Kusaie, Carolines; Taritari, Gilberts; Rangiroa, Paumotus; Suva, Fiji).—Fowler: B. P. Bishop Mus., Bull. 22, p. 15, 1925 (Guam).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 24, 1925 (Wake Island).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 352, 1928 (Samoa, Tari Tari, Rangiroa).

Chilinus undulatus Schmeltz: Mus. Godeffroy, Cat. 6, p. 16, 1877 (Tonga; Pelew Islands).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 245, pl. 133, 1881 (Tonga; Tahiti; Fanning Islands; Vavau; Ponapé; Paumotu; Carolines; Pelew Islands).

Cheilinus mertensii Valenciennes: Hist. nat. Poiss., vol. 14, p. 76, 1839 (type loc., Guam).—Elera: Cat. fauna Filipinas, vol. 1, p. 551, 1895 (Mariannas).

Cheilinus festivus Valenciennes: Hist. nat. Poiss., vol. 14, p. 77, 1839 (type loc., Oualan).—Elera: Cat. fauna Filipinas, vol. 1, 550 (Mariannes).

Cheilinus godeffroyi Günther: Zool. Soc. London, Proc., p. 666, pl. 66, 1871 (type loc., Tonga).

Cheilinus fasciatus (non Bloch) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 58, 1906 (Faté, New Hebrides).

Head 2 2/5; depth 2 2/3; D. IX, 10, 1; A. III, 8, 1; scales 14 in upper section of lateral line, 7 in median section to caudal base and 2 more on latter; 2 scales above lateral line, 6 below; 3 predorsal scales; snout 2 in head; eye 9 1/2; maxillary 2 3/5; interorbital 4. Least depth of caudal peduncle 2 1/2 in head. Head width 2 in its length. Snout width 1 2/3 its length. Teeth uniserial, with pair of close-set canines in front of each jaw. Gill rakers 5+14, lanceolate, equal gill filaments or 1 1/2 in eye. Scales with 12 basal radiating striae; 35 distinct apical striae, more or less parallel. Fourth dorsal spine 5 1/5 in head; seventh dorsal ray 2 1/5; second anal spine 5 1/4; sixth anal ray 2 1/5; caudal 1 3/5; pectoral 2; ventral 2 2/5. Dull brown, little paler below. Each scale on trunk with distinct darker area basally. Postocular with 2 black lines, upper only half extent of lower. From eye to mouth 2 narrow dusky bands, very close. Head with obscure pale brown vermiculations. Small black spot at occiput close above and behind eye. Dorsals, caudal and anal finely barred with dusky. Paired fins uniformly pale. Length 546 mm.

In the Bishop Museum 1 from Tuamotus? from Alvin Seale and 1 Faté. Four from Guam and 5 from Wake Island in 1923. The National Museum has 1 from Rangiroa. In the Agassiz Museum 1 from Kusaie and 1 Suva.

Cheilinus mertensii is evidently another synonym. It is noticed as follows:

Yellowish-gray, each scale with 2 vertical spots or streaks of pale violet. Two pale violet streaks before eye and 1 behind. Olive oblique streaks on occiput. Spinous dorsal and head covered with spots or small sinuous red streaks. Soft dorsals and anal with large violet spots. Caudal bordered yellowish. Pectoral olive. Length 204 mm.

Red Sea, Zanzibar, Mauritius, Seychelles, Ceylon, East Indies, Queensland, Micronesia, Melanesia, Polynesia.

Cheilinus diagrammus (Lacépède).

Labrus digrammus Lacépède: Hist. nat. Poiss., vol. 3, pp. 448, 518, 1802 (type loc., "Great Equatorial Ocean" [Indo-Pacific]).

Cheilinus diagrammus Valenciennes: Hist. nat. Poiss., vol. 14, p. 72, 1839 (New Guinea).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 354, 1928 (Samoa).

Cheilinus digrammus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 58, 1906 (Shortland Island).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol 25, p. 309, 1905 (1906) (Pago Pago).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 303, 1911 (Taritari, Gilberts; Kusaie, Carolines).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 24, 1925 (Johnston and Wake island).

Cheilinus radiatus Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).—Günther: Cat. fishes Brit. Mus., vol. 4, p. 131, 1862 (Louisiades).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (Kandavu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 586, 1882 (New Guinea).—Macleay: op. cit., vol. 8, p. 276, 1883 (southeast New Guinea).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 35, 1885 (Rubi, New Guinea).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1398, 1906 (Samoa).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 309, 1905 (1906) (Pago Pago).

Chilinus radiatus Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 247, pl. 135, fig. A, 1881 (Louisiades; Fiji; Samoa; Pelew Islands).

Distinguished by the 9 oblique, parallel black lines on the lower side of the head.

The National Museum has 2 from Hilo and 1 from Fiji, obtained by the Wilkes Expedition. Others through the Bureau of Fisheries are 1 from Taritari in the Gilbert Islands and 1 from Samoa. The Bishop Museum has 1 from Mangareva and 5 from Shortland Island. One from Johnston Island and 1 from Wake Island. One in the Agassiz Museum from Kusaie.

Red Sea, Zanzibar, Madagascar, Mauritius, Seychelles, East Indies, Philippines, Riu Kiu, Queensland, Melanesia, Micronesia, Polynesia.

Cheilinus unifasciatus Streets (Pl. XXXVIII, *B*).

Cheilinus unifasciatus Streets: U. S. Nat. Mus., Bull., no. 7, p. 82, 1877 (type loc., Fanning Islands).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 24, 1925 (French Frigates Shoal).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 357 (Midway Reefs, Johnston Island, type of *C. unifasciatus*, Hawaii).

Chilinus hexagonatus Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 247, pl. 135, fig. B, 1881 (type loc., Yap; Hawaiian islands).

Cheilinus hexagonatus Snyder: U. S. Fish Comm., Bull., vol. 22, p. 530, 1902 (1904) (Honolulu; off Molokai).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 319, fig. 136, 1903 (1905) (Honolulu; Hilo).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 73, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 29, 1925 (Honolulu).

Chilinus diagramma (non Lacépède) Smith and Swain: U. S. Nat. Mus., Proc., vol. 5, p. 133, 1882 (Johnston Island).

Chilinus zonurus Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 56, fig. 13, 1899 (1900) (type loc., Honolulu).—Jenkins: op. cit., vol. 22, p. 464, 1902 (1903) (Honolulu).

Head 2 1/2 to 2 3/5; depth 2 3/4 to 2 7/8; D. IX, 10, 1; A. III, 8, 1; scales 15 or 16 in upper section of lateral line, 6 in lower section to caudal base and 2 more on latter; 2 scales above lateral line, 6 below; 6 predorsal scales; snout 2 2/5 to 2 1/2 in head from upper jaw tip; eye 6 to 6 1/4; maxillary 2 2/3; interorbital 4 1/2.

Head width 2 4/5 to 2 7/8 in total head length. Snout conic, upper profile straight, width 1 1/2 to 1 3/5 in its length. Pair of strong canines in front of each jaw, lower closer. Interorbital convex. Gill rakers 7+10, short, firm, conic, 1 1/2 in gill filaments, which 1 4/5 in eye. Scales with 17 to 20 basal radiating striae, apical 27 to 32. Cheek scales biserial, upper row of 6 or 7, lower of 5, none on preopercle flange. Tubes in lateral line slender, each with short branchlet above. Caudal convex behind. Faded brownish, paler below. Pale obscure band across front of caudal peduncle, reflected on last dorsal and anal rays basally, dorsals otherwise rather dark gray-brown. Pectoral slightly paler than ventral. Length 202 to 228 mm.

Two Hawaiian specimens in the Academy. The Bishop Museum has 11 from Honolulu. Largest 436 mm. I found 22 specimens in the Honolulu markets in November and December, 1922. One from French Frigates Shoal in 1923. The National Museum has 4 specimens from the Fanning Islands including the types, 1 Johnston Island, 2 Samoa and 1 Hawaiian. In the Agassiz Museum 3 from the Hawaiian islands, of which 2 obtained by Andrew Garrett.

Cheilinus roseus Valenciennes (Hist. nat. Poiss., vol. 14, p. 78, 1839, type loc., Uléa) I cannot place as it is so imperfectly noticed: Uniform rose. Dorsal pale, with 2 longitudinal streaks like general color. Other fins more pale, uniform. Length 179 mm. Possibly it may have been based on a drawing of a faded specimen?

East Indies, Polynesia, Hawaii.

Cheilinus kitlitzii Valenciennes.

Cheilinus ketlitzii Valenciennes: Hist. nat. Poiss., vol. 14, p. 78, 1839 (type loc., Uléa).

Chilinus celebicus Bleeker: Nat. Tijds. Ned. Ind., vol. 5, p. 17, 1853 (type loc., Macassar).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, pp. 3, 4, 1859 (Doreh, New Guinea).

Cheilinus celebicus Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 35, 1885 (Rubi, New Guinea).

Muzzle very pointed. Forehead concave. Caudal rounded, without elongated filaments. Deep rose, with numerous deep red spots on head, trunk and caudal. Opercle with large spot of azure blue. Dorsal and anal rosy, with vertical red streak along each ray but not to tip. Length 115 mm. (Valenciennes)

Chilinus celebicus as figured by Bleeker agrees in most features except that it shows radiating red lines from the eye above, in front and behind, but not over cheek.

Cheilinus oxyrhynchus Bleeker.

Cheilinus oxyrhynchus Bleeker: Akad. Amsterdam, Verslagen, vol. 13, p. 300, 1862 (type loc., Celebes; Amboina; Batjan).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 22, 1869 (South Seas).

Chilinus oxyrhynchus Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 248, 1881 (Pelew Islands).

Differs from *Cheilinus kitlitzii* in the absence of radiating red lines from eye, head finely spotted or mottled brown and red. Opercular flap like rest of head. All vertical fins mottled and black blotch on first membrane of spinous dorsal. Length 141 mm. (Bleeker)

East Indies, Micronesia.

Cheilinus chlorurus (Bloch).

Sparus chlorourus Bloch: Nat. ausländischen Fische, vol. 5, p. 24, pl. 260, 1791 (type loc., "Japan; St. Domingo").

Cheilinus chlorurus Günther: Cat. fishes Brit. Mus., vol. 4, p. 128, 1862 (Aneiteum).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 586, 1882 (New Guinea).—Vaillant: Soc. Philom. Paris, Bull., 7th ser., vol. 11, p. 53, 1887 (Tahiti).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 129, 1913 (Saonek, Waigiu).—Weber: Siboga Exped., vol. 65, p. 363, 1913 (Atjatuning, west coast New Guinea).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 15, 35, 1925 (Guam; Samoa).—Fowler and Bean: U. S. Nat. Mus., Bull., 100, p. 362, 1928 (Apra Bay on Guam, Apia).

Chilinus chlorurus Günther: Rept. voyage "Challenger," vol. 1, p. 36, 1880 (Levuka, Fiji).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 15, p. 245, pl. 132, 1881 (New Hebrides; Pelew Islands; Society Islands: Tonga; Paumotus; Fiji; Yap; Ponapé).—Boulenger: Ann. Mag. Nat. Hist. London, 6th. ser., vol. 20, p. 373, 1897 (Routuma Island).

Thalliurus chlorurus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 58, 1906 (Mangareva; Tahiti; Faté; Shortland Island; Makatea; Paumotus).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 310, 1905 (1906) (Apia; Pago Pago).

Cheilinus sanguineus Valenciennes: Hist. nat. Poiss., vol. 14, p. 79, 1839 (type loc., Uléa).

Chilinus punctatus Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma Island).

Cheilinus trilobatus (non Lacépède) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 59, 1906 (Tubuai; Faté).

Cheilinus undulatus (non Rüppell) Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 141, 1912 (Mangareva).

The Bishop Museum has 3 from Shortland Island, 5 Mangareva, 2 Makatea, 1 Faté, 1 Tu-

buai, 1 Tahiti. Largest 250 mm. Two from Guam in 1923. In the National Museum 1 from Fiji, 2 Samoa or Fiji, 1 Paumotus, and 3 "Hilo," obtained by the Wilkes Expedition. Other materials are 2 from New Guinea and 7 from Apia. One from Mangareva as *Cheilinus undulatus*. The squamation of the cheek is that of the present species and not the sparse scales of small size as shown in Günther's figure of *Cheilinus undulatus*. The Agassiz Museum has 7 from the Society Islands and 1 from Kingsmill Islands, all through Andrew Garrett. Also 6 from Ascension Island, Marshall Islands, through Rev. A. Strong in 1877. The Academy has 2 from Apia.

Cheilinus punctatus Bennett (Zool. Soc. London, Proc., vol. 1, p. 167, 1831, type loc., Mauritius) is evidently the same. Evidently *Cheilinus sanguineus* is another synonym. It is noticed as follows: Snout pointed. Forehead concave. Body deep red, some spots deeper colored, and this color extends over all fins. Dorsal and anal spotted like caudal, points of which prolonged in filaments. Length 203 mm.

Mauritius, Seychelles, Colon, Andamans, East Indies, Philippines, Japan, Queensland, Melanesia, Micronesia, Polynesia.

Novaculichthys macrolepidotus (Bloch).

Labrus macrolepidotus Bloch: Nat. ausländischen Fische, vol. 5, p. 135, pl. 284, fig. 2, 1791 (type locality unknown).

Xyrichthys macrolepidotus Valenciennes: Hist. nat. Poiss., vol. 14, p. 44, 1839 (Waigiu).

Novaculichthys macrolepidota Macleay: Linn. Soc New South Wales, Proc., vol. 8, p. 274, 1883 (Hula, Hood Bay, New Guinea).

Labrus arago Quoy and Gaimard: Voyage "Uranie," Zool., p. 263, pl. 65, fig. 2, 1824 (type loc., Iles des Papous).

Julis taenianotus (Cuvier) Quoy and Gaimard: Voyage "Uraine," Zool., p. 271, 1824 (type loc., Waigiu).

Body rosy. Black band from snout to eye, 2 postocular with lower to opercular flap and 1 above eye. Row of black spots along lower section of lateral line. According to Bleeker reaches 141 mm.

Zanzibar, Mozambique, Siam, East Indies, Philippines, Riu Kiu.

Novaculichthys taeniourus (Lacépède) (Pl. XLI, *A*).

Labrus taeniourus Lacépède: Hist. nat. Poiss., vol. 3, pp. 448, 518, pl. 29, fig. 1, 1802 (type loc., "The Great Equatorial Ocean" [Indo-Pacific]).

Novacula (*Novaculichthys*) *taeniura* Peters: Akad. Wiss. Berlin, Monatsb., p. 843, 1876 (1877) (New Ireland).

Novacula taeniurus Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 284, 1909 (Pelew Islands, Carolines, New Hebrides, Samoa, Society Islands).

Novaculichthys taeniurus Snyder: U. S. Fish Comm., Bull., vol. 22, p. 530, 1902 (1904) (Honolulu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 311, 1905 (1906) (Pago Pago; Apia).—Jordan and Dickerson, U. S. Nat. Mus., Proc., vol. 34, p. 614, 1908 (Suva, Fiji).

Novaculichthys taeniourus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 325, fig. 138, 1903 (1905) (Honolulu; Hilo).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 73, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 29, 35, 1925 (Honolulu; Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 24, 1925 (Wake Island).

Julis vanikorensis Quoy and Gaimard: Voyage "Astrolabe," Zool., vol. 3, p. 704, pl. 20, fig. 1, 1834 (type loc., Vanikoro).

Xyrichthys vanikolensis Valenciennes: Hist. nat. Poiss., vol. 14, p. 43, 1839 (New Hebrides, Vanikoro).

Novacula vanicolensis Günther: Cat. fishes Brit. Mus., vol. 4, p. 172, 1862 (Aneiteum).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Samoa).—Schmeltz: op. cit., Cat. 5, p. 34, 1874 (Tahiti).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 588, 1882 (New Guinea).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 504, 1901 (Honolulu.

Novaculichthys vanicorensis Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, pt. 1, p. 131, 1902 (1903) (Marcus Island).

Novacula hoedtii Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (South Sea).

Novaculichthys hemisphaerium Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 464, 1902 (1903) (Honolulu).

Head 2 4/5 to 2 7/8; depth 2 3/4; D. IX, 12, 1; A. III, 12, 1; scales 20 or 21 in upper section of lateral line, 4 or 5 in lower section to caudal base and 1 or 2 more on latter; 3 scales above lateral line, 10 below; snout 3 1/4 to 3 2/5 in head; eye 5 2/5 to 7 1/6; maxillary 3 1/6 to 3 2/3; interorbital 5 3/4 to 6.

Head width 1 1/4 to 1 1/3 in its length. Eye small, high, advanced entirely from head center. Canines 2/2, lower closer. Interorbital convex, with slight median ridge extending on snout and predorsal. Gill rakers 7+8, lanceolate, 1 1/2 in gill filaments, which equal eye. Scales with 67 to 84 basal radiating striae, 106 to 118 apical. Dull brownish generally, edge of each scale darker Black bar on humeral scale above pectoral base. Black blotch at front of spinous dorsal. Dorsals and anals with close-set dusky waved bars transversely, terminal mostly broken as spots and general-color pale buff-brown. Caudal pale brownish-buff, outer 2/3 dusky, with obscure darker spots or blotches vertically. Pectoral base dusky, rest of fin pale brown. Ventral dusky, hind edge narrowly whitish. Three dark lines radiate from eye backward, median widely forked, all narrowly edged pale. Lower surface of head buff brown.

Young differ from adult in having dark lines on head radiating from pupil, besides posterior 2 more below, 1 forward and 1 above. Also 4 or 5 transverse bars on forehead and snout. Length 92 to 230 mm.

The Academy has 4 from Honolulu and 2 from Apia. In the National Museum 1 from Hilo collected by the Wilkes Expedition. Through the Bureau of Fisheries 1 Hawaiian, 5 Honolulu, and 3 from Apia. The Bishop Museum has 11 from Honolulu and 1 from Marcus Island, largest 272 mm. I examined 72 specimens in the Honolulu markets in November and December, 1922. One from Wake Island in 1923. The Agassiz Museum has 3 Hawaiian, 17 from the Kingsmill Islands, and 1 Society Islands of which both from Andrew Garrett, 2 Kusaie in the Carolines, 3 Ebon Island, and 3 Ascension Island, from Rev. B. G. Snow in 1877.

Zanzibar, Madagascar, Reunion, Mauritius,

East Indies, Philippines, Melanesia, Micronesia, Polynesia, Hawaii.

Novaculichthys bifer (Lay and Bennett) (Pl. XLI, *B*).

Julis bifer Lay and Bennett: Zool. Beechey's voyage, p. 64, pl. 18, fig. 2, 1839 (type loc., Oahu).

Novaculichthys bifer Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 367, 1928 (Honolulu).

Novacula kallosoma Bleeker: Soc. Sci. Ind. Neerl., Act. (Amboina), vol. 8, p. 5, 1860 (type loc., Amboina).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 286, 1909 (Ponapé, Tahiti, Samoa, Hawaii).

Novaculichthys kallosoma Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 28, p. 125, 1904 (Honolulu, Samoa).—Snyder: U. S. Fish Comm., Bull., vol. 22, p. 530, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 327, pl. 41, 1903 (1905) (Honolulu, Pago Pago).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 73, 1922 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 15, 29, 1925 (Guam; Honolulu).

Novaculichthys kallosomus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 311, 1905 (1906) (Pago Pago).

A small green species, variegated with white blotches, and first 2 dorsal spines prolonged.

In the Bishop Museum 8 from Honolulu, obtained during 1907, 1908, 1909, 1910, 1915, 72 to 122 mm. long. I found 1 in the Honolulu markets January 7, 1923. One from Guam in 1923. One in the National Museum from Honolulu, obtained by L. Berndt in 1906. Three in the Agassiz Museum obtained by Andrew Garrett at Oahu, 76 to 101 mm.

East Indies, Philippines, Micronesia, Polynesia, Hawaii.

Cymolutes lecluse (Quoy and Gaimard).

Xyrichthys lecluse Quoy and Gaimard: Voyage "Uranie," Zool., p. 284, pl. 65, fig. 1, 1824 (type loc., Hawaii).

Cymolutes leclusii Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 18, 1902 (Honolulu).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 289, 1909 (Hawaii).

Cymolutes lecluse Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 465, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 23, p. 531, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 327, 1903 (1905) (Hilo; Honoluiu).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 368, 1928 (Hawaii, Honolulu, Namuka).

Cymolutes leclusei Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 74, Dec. 1922 (Honolulu).

Cymoleutes lecluse Fowler: B. P. Bishop Mus., Bull. 22, pp. 15, 29, 1925 (Guam; Honolulu).

Julis praetextata Quoy and Gaimard: Voyage "Astrolabe," Zool., vol. 3, p. 712, pl. 15, fig. 4, 1834 (type loc., "Mauritius").

Cymolutes praetextatus Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 289, 1909 (Pelew Islands).—Kendall and Goldsbrough: Mus. Comp. Zool., Mem., vol. 26, p. 304, 1911 (Namuka, Tonga Islands).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).

Xyrichthys microlepidotus Valenciennes: Hist. nat. Poiss., vol. 14, p. 39, 1839 (type loc., Hawaii).

Julis kuekuel Thiollière: Fauna Woodlark, p. 195, 1857 (type loc., Woodlark Island).

Novacula microlepis Vaillant and Sauvage: Rev. Mag. Zool., 3rd ser., vol. 3, p. 284, 1875 (type loc., Hawaiian islands).

Head 3 1/10 to 3 1/8; depth 3 2/5 to 3 3/4; D. IX, 13, 1 or 14, 1; A. III, 13, 1; scales 52 to 57 in upper section of lateral line, 18 in lower section to caudal base; 8 scales above lateral line, 21 or 22 below, 5 predorsal; snout 2 in head; eye 5 1/5 to 6; maxillary 3 1/10 to 3 1/4; interorbital 4 2/5.

Head width 2 2/5 in its length. Snout compressed, profile convex, width 1 7/8 to 2 1/8 its length. Eye midway in head, well elevated. Canines 2/2, lower closer. Interorbital convex. Gill rakers 7+12, lanceolate, firm, slender, 1/2 of gill filaments, 1 1/2 in eye. Scales with 26 to 32 basal marginal striae, apical 25 to 32. Brownish, lower surface paler. Fins all pale brown. Black line on first membrane of spinous dorsal. Small black spot below 22nd scale of lateral line, with pale border in larger specimens, not in others.

In the Academy 4 from Honolulu, 130 to 157 mm. The National Museum has 1 from Hawaii obtained by the Wilkes Expedition. Also 5 from Honolulu and 1 from Namuka through the Bureau of Fisheries. The Bishop Museum has 9 from Honolulu and 1 from Laysan Island obtained in 1903 by W. A. Bryan. I also examined 80 specimens in the Honolulu markets in November and December, 1922, and January, 1923. Largest 185 mm. in the Bishop Museum. Nine from Guam in 1923.

Mauritius, East Indies, Melanesia, Micronesia, Polynesia, Hawaii.

Hemipteronotus pentadactylus (Linné).

Coryphaena pentadactyla Linné: Systema nat., 10th ed., p. 261, 1758 (type loc., India).

Novacula pentadactyla Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 274, 1883 (Hood Bay, New Guinea).

Hemipteronotus pentadactylus Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 38, p. 25, 1927 (Honolulu).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 370, 1920 (Hawaii, Honolulu).

Hemipteronotus punctulatus Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).

Hemipteronotus umbrilatus Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 53, fig. 10, 1899 (1900) (type loc., Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 16, 19, 1902 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 464, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 333, fig. 141, 1903 (1905) (Hilo; Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 74, 1922 (Hawaii).

Head 3 to 3 1/8; depth 2 2/5 to 2 3/5; D. II, VII, 12, 1; A. III, 12, 1; scales 19 or 20 in upper section of lateral line and 4 more in lower section to caudal base, with 1 or 2 more on latter; 3 or 4 scales above lateral line, 9 or 10 below; snout 1 4/5 to 2 in head; eye 5 4/5 to 6 3/5; maxillary 2 1/3 to 2 2/3; interorbital 4 1/4 to 4 7/8.

Head width 2 to 2 1/3 in its length. Snout depressed, trenchant median ridge extends to occiput, width half its length. Maxillary not quite reaching eye. Pair of moderate protruding canines in front of each jaw, lower pair closer. Gill rakers 5+9, strong, lanceolate, 1/3 of gill filaments, which equal eye. Scales with 96 to 123 basal marginal striae, apical very obscure. Cheek with 8 rows of scales. Dull brownish generally. Dusky vertical band 5 scales wide at hind half of pectoral. Fins all uniform brownish. Length 190 to 248 mm.

Three in the Academy from Honolulu. In the Bishop Museum 13 from Honolulu. I also examined 25 in the Honolulu markets in December, 1922. I have only had 4 smaller specimens from Takao, Formosa, in the National Museum, for comparison. These have the dark lateral blotch very much smaller, the presence of small dark blotches along the beginning of the lateral line and much fewer marginal basal striae on scales. *Hemipteronotus umbrilatus* Jenkins is synonymous, the type crudely figured being much smaller than my specimens.

Red Sea, Mauritius, India, East Indies, Philippines, Formosa, China, Hawaii.

Hemipteronotus twistii (Bleeker).

Novacula twistii Bleeker: Nat. Tijds. Ned. Ind., vol. 10, p. 381, 1856 (type loc., Ternate).

Hemipteronotus twistii Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).

Differs from *Hemipteronotus melanopus* in the absence of a black blotch on last anal rays. According to Bleeker reaches 170 mm.

East Indies.

Hemipteronotus melanopus (Bleeker).

Novacula melanopus Bleeker: Soc. Ind. Neerl., Act. (Amboina), vol. 2, p. 82, 1857 (type loc., Amboina).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 286, 1909 (Hawaiian islands).

Hemipteronotus melanopus Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 38, p. 25, 1927 (Honolulu).

Hemipteronotus baldwini Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 192, 1902 (1903) (Honolulu; Hilo).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 334, pl. 39, 1903 (1905) (Honolulu; Hilo).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 74, 1922 (Hawaii).

Hemipteronotus jenkinsi Snyder: U. S. Fish Comm., Bull., vol. 22, p. 503, pl. 10, fig. 19, 1902 (1904) (type loc., Puako Bay, Hawaii).

Head 3 1/4; depth 2 2/3 to 3; D. II, VII, 12, 1; A. III, 12, 1 or 13, 1; scales 20 or 21 in upper section of lateral line and 4 in lower section to caudal base, 1 more on latter; 3 scales above lateral line, 9 or 10 below; snout 1 2/3 to 2 in head; eye 5 1/4 to 6 2/5; maxillary 3 1/6 to 3 1/3; interorbital 4 4/5 to 5 1/2.

Head width 2 1/4 to 2 1/2 in its length. Snout compressed, trenchant median ridge extends to occiput; width 2 1/2 to 2 3/5 its length. Maxillary not quite reaching opposite eye. Pair of moderate protruding canines in front of each jaw, lower closer. Gill rakers 5 + 11, lanceolate, 1/2 of gill filaments, which 1 1/5 in eye. Scales with 69 to 96 basal radiating striae, 9 to 143 obscure apically; circuli very fine. Faded dull brown. Rounded pale yellowish blotch 4 scales wide at outer half of pectoral. Blackish-brown blotch at 8 to 10 scales of lateral line, in adult to spinous dorsal base, in young only one scale above, in both 2 scales below. Young often with few blackish-brown spots along lateral line behind large dark blotch. Adult with blackish blotch on second and third dorsal spine membranes marginally, transversely oblique grayish lines on dorsals and anals and latter with black blotch terminally on last 3 membranes. Length 175 to 235 mm.

In the Academy 3 Hawaiian specimens and paratype of *Hemipteronotus baldwini*. The National Museum has the types of *Hemipteronotus baldwini* and *Hemipteronotus jenkinsi*, and 5 specimens from Honolulu. In the Bishop Museum 6 from Honolulu. The Agassiz Museum has 1 from Hilo and 2 from Honolulu.

The above all differ with Bleeker's figure (Atlas ichth., vol. 1, pl. 29, fig. 3, 1863) in the presence of the dark blotch above the pectoral end, though agree in every other way.

East Indies, Hawaii.

Iniistius pavo (Valenciennes).

Xyrichthys pavo Valenciennes: Hist. nat. Poiss., vol. 14, p. 45, pl. 394, 1840 (type loc., Mauritius; Bourbon).

Novacula pavo Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).—Bleeker: Soc. Sci. Ind. Neerl., no. 2, vol. 6, p. 4, 1859 (1860) (Doreh, New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 287, 1909 (Ponapé; Mortlock; Tahiti; Honolulu).

Novacula (Iniistius) pavo Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 505, 1901 (Honolulu).

Iniistius pavo Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 16, 18, 1902 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 29, 1925 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 38, p. 25, 1927 (Honolulu).

Xyrichthys pavoninus Valenciennes: Hist. nat. Poiss., vol. 14, p. 47, 1840 (type loc., Hawaiian islands).

Iniistius pavoninus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 465, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 531, 1902 (1904) (Honolulu; Puako Bay).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 329, pl. 42, fig. 139, 1903 (1905) (Honolulu; Hilo; Kailua).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 74, 1922 (Honolulu).

Novacula (Xirichthys) carneflava Peters: Akad. Wiss. Berlin, Monatsb., p. 843, 1876 (7877) (type loc., Dana Island [Dana Peak in Fiji?]).

Iniistius leucozonus Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 54, fig. 11, 1899 (1900) (type loc., Honolulu).—Jenkins: op. cit., vol. 22, p. 465, 1902 (1903) (Honolulu).

Novacula (Iniistius) tetrazona Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 505, 1901 (Honolulu).

Iniistius tetrazonus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 15, 20, 1902 (Hilo; Honolulu).

Head 3 to 3 1/8; depth 2 2/5 to 2 3/5; D. II-V to VII, 12, 1 to 14, 1; A. III, 11, 1 or 12, 1; scales 20 to 21 in upper section of lateral line, 4 or 5 in lower section to caudal base and 1 or 2 more on caudal base; 3 or 4 scales above lateral line, 10 or 11 below; snout 1 4/5 to 2 1/10 in head; eye 5 7/8 to 8; maxillary 3 1/6 to 3 2/5; interorbital 4 2/3 to 5 1/8. Least depth of caudal peduncle 2 2/5 in head; first dorsal spine 1 4/5; first dorsal ray 3; third anal spine 3 3/4; third anal ray 2 7/8; caudal 1 2/3; pectoral 1 1/2; ventral 1 4/7.

In the Academy 3 Hawaiian specimens 180 to 185 mm. The National Museum has 2 obtained at Maui by the Wilkes Expedition. Also 2 Hawaii of which 1 from Puako Bay, collected by the *Albatross*. The Bishop Museum has 24 from Honolulu and 2 from Hilo. Largest 377 mm. I examined 240 specimens in the Honolulu markets during November and December, 1922. The Agassiz Museum has 6 Hawaiian specimens, of which 1 adult obtained by Andrew Garrett.

Zanzibar, Mauritius, Bourbon, East Indies, Micronesia, Polynesia, Hawaii.

Iniistius niger (Steindachner) (Pl. XLI, *C*).

Novacula (Iniistius) nigra Steindachner: Akad. Wiss.

Wien, Anz., vol. 16, p. 176, June 27, 1900 (type loc., Honolulu).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 505, pl. 4, fig. 2, 1901 (Honolulu).

Iniistius niger Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 18, 1902 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 194, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 331, fig. 140, 1903 (1905) (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 74, 1922 (Hawaii).

Iniistius verater Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 55, fig. 12, 1899 (1900) (type loc., Honolulu).

This species differs from *Iniistius pavo* in no important structural characters. In specimens 178 mm. long the scales have 71 basal radiating striae. The body is deep chocolate-brown and the fins blackish.

In the Bishop Museum 17 from Honolulu, largest 199 mm. I found only a single specimen in the Honolulu markets, December 20, 1922. One in the National Museum from Hawaii. In the Academy 3 Hawaiian specimens.

Iniistius aneitensis (Günther).

Novacula aneitensis Günther: Cat. fishes Brit. Mus., vol. 4, p. 176, 1862 (type loc., Aneiteum, New Hebrides).—Günther: Cruise of "Curaçoa" (Brenchley), p. 410, 1873 (Solomons).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 285, pl. 147, fig. a, 1909 (type).

Xyrichthys niveilatus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 194, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 337, fig. 142, 1903 (1905) (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 74, 1922 (Hawaii).

Differs from *Iniistius pavo* chiefly in the first 2 dorsal spines being connected by membrane with third, at least basally.

In the Bishop Museum 6 from Honolulu. Largest 269 mm. The National Museum has the type of *Xyrichthys niveilatus* and 1 from Hawaii. In the Agassiz Museum 1 from Honolulu.

Zanzibar, Melanesia, Hawaii.

Xyrichthys javanicus (Bleeker).

Novacula javanicus Bleeker: Akad. Wet. Amsterdam, Verslagen, vol. 13, p. 305, 1862 (type loc., Java).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Kandavu).

Like the Atlantic *Xyrichthys psittacus* (Linné) in the presence of scales close along lower hind eye edge. It differs, however, in the head without blue lines. According to Bleeker reaches 121 mm.

The nominal *Hemipteronotus copei* Fowler, Acad. Nat. Sci. Philadelphia, Proc., p. 508, pl. 20, fig. 1, 1900, "Oahu" [No. 521, W. H. Jones], is surely a specimen of *Xyrichthys psittacus* (Linné) and likely obtained somewhere in the tropical Atlantic. For convenience a reexamination of the type of *Hemipteronotus copei* discloses the following:

Head 4; depth D. IX, 12, 1; A. III, 12, 1; scales 20 in upper section of lateral line, 5 in lower section to caudal base; 3 scales above lateral line, 9 below; 3 predorsal scales; snout 1 3/4 in head; eye 5 1/5; maxillary 3 2/5; interorbital 6. Head width 2 5/6 in its length. Snout well compressed, width 2 1/4 in its length. Eye high, slightly before middle in head length. Pair of strong canines in front of each jaw, lower closer and fit in between upper in closed jaws. Gill rakers 7 + 12, lanceolate, rather firm, 1/2 of gill filaments, which 1 1/2 in eye. Scales with 46 to 65 basal radiating striae, apical 86 to 70; circuli extremely fine. Brownish-olive, little paler on belly and abdomen. Rather numerous gray-blue vertical lines on side of head.

It has also recently been redescribed again as *Xyrichthys binghami* Mowbray (Marine Life, Occ. Papers, vol. 1, no. 1, p. 1, fig., April 2, 1925, type loc., Cay Sal Bank, Bahamas).

East Indies, Polynesia.

Xyrichthys virens Valenciennes.

Xyrichthys virens Valenciennes: Hist. nat. Poiss., vol. 14, p. 35, 1839 (type loc., Tahiti).—Fowler: B. P. Bishop Mus., Bull. 38, p. 25, 1927 (Honolulu).

Coryphaena virens (Parkinson) Valenciennes: Hist. nat. Poiss., vol. 14, p. 35, 1839 (type loc., Tahiti) (name in text).

Novaculichthys virens Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).

Novaculichthys woodi Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 52, fig. 8, 1899 (1900) (type loc., Honolulu).—Jenkins: op. cit., vol. 22, p. 465, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 323, fig. 137a, pl. 40, 1903 (1905) (Hilo; Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 73, 1922 (Hawaii).

Novaculichthys entargyreus Jenkins: U. S. Fish Comm., vol. 19, p. 53, fig. 9, 1899 (1900) (type loc., Honolulu).

Novaculichthys tattoo Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 4, p. 5, fig. 2, 1901 (type loc., Honolulu).

Head 3; depth 2 2/3; D. IX, 12, 1; A. III, 12, 1; scales 20 in upper section of lateral line, 5 in lower section to caudal base and 1 more on latter; 3 scales above lateral line, 10 below; snout 2 3/5 in head; eye 5 1/3; maxillary 3 1/2; interorbital 4 2/3. Head width 2 3/5 in its length. Snout compressed, with slight median keel to occiput, width 1 3/5 its length. Pair of canines in front of each jaw, lower pair closer. Interorbital convexly elevated. Gill rakers 6 + 11, spinescent, lanceolate, 1/2 of gill filaments, 1 1/2 in eye. Scales with 58 to 68 basal radiating striae, 90 to 107 apically obscure. Head entirely scaleless. Body pale uniform brown, with dusky blotch on each membrane of spinous dorsal, fin brown. Soft dorsal, anal and caudal pale yellowish. Pectoral and ventral pale brown. Length 147 mm.

One in the Academy from the Hawaiian islands. In the Bishop Museum 9 from Honolulu and type of *Novaculichthys tattoo,* largest 159 mm. I found 4 in the Honolulu markets during December, 1922. In the National Museum an adult from Hawaii.

Polynesia, Hawaii.

CALLYODONTIDAE

Among the numerous nominal and imperfectly described fishes of this family are two which appear unidentifiable.

Scarus spilurus Valenciennes: Hist. nat. Poiss., vol. 14, p. 207, 1839 (type loc., Caroline Islands).

D. VIII, 9; A. III, 8; tubes in lateral line slender, simple, well exposed; teeth strongly crenulate. Blue green, banded ashy-blue and large yellow spot each side of tail. Teeth green. Lips edged rose, then broad deep green bridle followed by deep rose below. Dorsal green, base rose, bands divide on soft fin in 2 streaks,

between which green points. Anal same, with rosy median band. Length 179 mm. (Valenciennes)

Scarus roseiceps Valenciennes: Hist. nat. Poiss., vol. 14, p. 208, 1839 (type loc., Uléa).

D. IX, 10; A. II, 9; jaws crenated; scales in lateral line little ramose. Head rose, blue blotch on cheek. Trunk rose, back orange-yellow, below clear red-brown speckled with brown. Dorsal, anal and ventral rosy, dorsal rays yellow. Caudal concave behind, margin deep red. Length 206 mm. (Valenciennes)

Scarichthys auritus (Valenciennes).

Scarus auritus (Kuhl and Van Hasselt) Valenciennes: Hist. nat. Poiss., vol. 14, p. 161, 1830 (type loc., Java).

Scarichthys auritus Günther: Cat. fishes Brit. Mus., vol. 4, p. 213, 1862 (Aneiteum).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Kandavu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 276, 1883 (Hula, Hood Bay, New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 59, 1906 (Rarotonga).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 299, 1909 (Ponapé, Aneiteum, Rarotonga).—Fowler: B. P. Bishop Mus., Bull. 22, p. 15, 1925 (Guam).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 373, 1928 (Vavau).

Scarus naevius Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).

Scarichthys caeruleopunctatus (non Rüppell) Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 304, 1911 (Vavau, Tonga Islands).

Head 3 to 3 1/5; depth 3 1/3 to 3 1/2; D. IX, 10, 1; A. II, 9, 1; P. 12; V. I, 5; scales 17 to 19 in upper section of lateral line, 4 in lower section to caudal base and 2 more on latter; 2 scales above lateral line, 5 or 6 below; 3 predorsal scales; snout 2 7/8 to 3 1/8 in head; eye 4 3/4 to 5 2/3; maxillary 3 3/4 to 4 1/3; interorbital 4 1/8.

Body strongly compressed, elongately ovoid, with greatest depth at middle of pectoral and predorsal but slightly keeled. Caudal peduncle strongly compressed, about long as deep, least depth 2 1/6 to 2 2/5 in head.

Head well compressed, profiles alike, width 2 in its length. Snout conic, compressed, width 1 to 1 1/8 in its length. Eye elevated, hind edge midway in head length. Mouth with slightly curved gape, extends 2/3 to eye and mandible slightly shorter. Teeth 3, 5, 10, sometimes 8 more, each side above; lower 3, 7, 10, sometimes 7 more each side; all form continuous cutting-edges and outer faces of bony jaws entirely smooth. No posterior canines. Lips wide, fleshy, cover teeth entirely. Front nostril at last fourth in snout; hind nostril closer to front one than to eye. Interorbital widely convex. Preopercle entire.

Gill opening extends forward about opposite eye center. Gill rakers 3 + 10?, short, rather firm points, about 1/4 of gill filaments, which equal eye. Pseudobranchiae 1 1/2 in gill filaments. Isthmus wide, equals eye.

Scales with 3 basal lobes; basal striae 14 or 15, auxiliaries 2 or 3; apical striae 28 to 30, with 20 to 30 auxiliaries; circuli fine. Scales large, in even longitudinal series, large on breast and caudal base. Cheek with row of 4 scales below suborbitals. Tubes in lateral line trifid.

Spinous dorsal inserted close behind head, spines all flexible terminally, scarcely distinguishable from soft rays; first spine 2 2/5 to 2 1/2 in head. Soft dorsal inserted little nearer caudal base than eye, first ray 2 1/4 in head. Anal origin falls little behind that of soft dorsal, edge of fin slightly notched; third ray 2 2/5 to 2 1/2 in head. Caudal rounded, 1 1/5 to 1 2/5 in head. Pectoral rounded, 1 2/3 to 1 3/4. Ventral close behind pectoral base, 1 7/8 to 2 in head.

Color in alcohol light brownish generally. Back and vertical fins with 4 or 5 black transverse bars. Along side of trunk 6 blotches of black 2 or 3 scales in width. On anal 3 black bars extend transversely. Black blotch on pectoral base. Ventral with 2 dull brownish crossbars. Caudal with 3 faint brown crossbars. Iris pale slaty. Length 145 mm.

One in the Bishop Museum from Rarotonga, Cook Islands, and 1 from Guam in 1923. In the Agassiz Museum 2 from Ascension Island, through Rev. A. A. Strong in 1877. Length 265 mm. In the National Museum 1 from Vavau as *Scarichthys caeruleopunctatus*, length 69 mm.

Zanzibar, Mozambique, Mauritius, Seychelles, East Indies, Philippines, China, Queensland, Melanesia, Micronesia, Polynesia.

Scarichthys coeruleopunctatus (Rüppell).

Scarus (Calliodon) coeruleopunctatus Rüppell: Neue Wirbelth. Fische, p. 24, pl. 7, fig. 3, 1835 (type loc., Djedda, Red Sea).

Scarichthys coeruleopunctatus Schmeltz: Mus. Godeffroy, Cat. 5, p. 34, 1874 (Samoa).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 59, 1906 (Rarotonga).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 300, 1909 (Rarotonga).

Scarichthys caeruleopunctatus Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 589, 1882 (New Guinea).

Head 3; depth 2 4/5; D. IX, 10, 1; A. III, 9, 1; scales 18 in upper section of lateral line, 4 in lower section and 2 on caudal base; 2 scales above lateral line, 6 below; 4 predorsal scales; snout 2 3/4 in head; eye 5 2/5; maxillary 3 3/5; interorbital 3 4/5. Least depth of caudal peduncle 2 1/3 in head. Lips cover teeth. Cheek with row of 4 scales, cover half way to preopercle ridge. Posteriorly 2 flaring canines forward each side above. First dorsal spine 2 2/5 in head; first dorsal ray 2 1/3; third anal spine 3 1/8; third anal ray 2 1/2; caudal 1 1/2; pectoral 2; ventral 1 9/10.

In the Bishop Museum 3 from Rarotonga, 102 to 248 mm. In the Agassiz Museum 1 from Ascension Island in the Marshall Islands, obtained by the Rev. A. A. Strong in 1877. In poor condition.

Red Sea, Zanzibar, Mauritius, Seychelles, India, East Indies, Philippines, Micronesia, Polynesia.

Scaridea balia Jenkins.

Scaridea balia Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 469, fig. 27, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 344, fig. 147, 1903 (1905) (type).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 384, 1923 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 29, 1925 (Honolulu).

Head 2 7/8; depth 2 4/5; D. IX, 10, 1; A. II, 9, 1; scales 18 in upper section of lateral line, 5 in lower section and 2 on caudal base; 2 scales above lateral line, 6 below; 4 predorsal scales; snout (to end of teeth) 2 7/8 in head; eye 4 1/3; maxillary 3 1/2; interorbital 4 2/3.

Body elongately ovoid, strongly compressed. Least depth of caudal peduncle 2 2/3 in head. Head well compressed, width 2 1/10 in its length. Snout conic, long as wide. Eye with hind edge midway in head, impinging on upper profile. Teeth distinct in jaws, upper left 3, 4, 2, 1, right 2, 2, 2, 1; lower left 2, 2, 2, 3, 6, right 2, 3, 3, 4, 3. No posterior canines. Lips cover about half of teeth. Above also inner posterior row of small lateral teeth each side. Nostrils together, anterior with small tentacle, about last fourth in snout.

Interorbital broad, very slightly depressed. Gill rakers 4 + 8, lanceolate, 2 2/3 in gill filaments, which 1 1/2 in eye. Pharyngeal teeth in 5 or 6 series above, 3-3 series below. Scales with 31 basal radiating striae, 38 parallel apically. Row of 4 large scales on cheek, not quite extending to preopercle ridge, only narrow area of skin between. Tubes of lateral line with 3 to 8 branches. Dorsal spines all pungent and firm; first spine 2 1/4 in head; ninth 2 1/8; eighth dorsal ray 2 1/4; second anal spine (with filament) 3; eighth anal ray 2 7/8; caudal truncate, 1 2/5; pectoral 1 2/5; ventral 2 2/3.

Brown, mottled and marbled paler and darker. About 6 rows of 4 or 5 rounded whitish spots on trunk. Dorsals and anals mottled with brownish, also caudal, which dusky terminally and mottlings assuming more of bars or transverse lines. Head profusely spotted with gray-white. Pectoral and ventral pale brown. Eye brown. Teeth whitish. Length 148 mm.

One in the Bishop Museum from Honolulu, taken in September, 1901, by John W. Thompson, who reports a number of specimens found irregularly in the markets since, all of small size. I found 3 in the Honolulu markets December 23, 1922. The above described specimen is more mottled and with more numerous white spots than shown in the original figure. The head also has many small white points. Type of *Scaridea balia* in the National Museum.

This species bears a very great resemblance to *Callyodon spinidens* Bleeker (Atlas ichth., vol. 1, pl. 2, fig. 2, 1862) except that it has a darker pectoral base and a black blotch at the front of the spinous dorsal as in *Callyodon moluccensis* Bleeker.

Scaridea octodon new species (fig. 59).

Scarichthys auritus (non Valenciennes) Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 511, 1900 (Hawaii).

Head 3; depth 2 1/2; D. IX, 10, 1; A. III, 9, 1; P. II, 11; V. I, 5; scales 19 in upper section of lateral line, 7 in lower section of which last 2 on caudal base; 2 scales above lateral line to spinous dorsal origin, 2 above to soft dorsal origin, 6 below to spinous anal origin; 4 predorsal scales; snout 3 in head; eye 4 1/8; maxillary 3 2/3; interorbital 4 2/3.

Body elongate, nearly ellipsoid, strongly compressed, profiles more or less alike, edges rounded and greatest depth near end of pectoral. Caudal peduncle well compressed, deep as long, least depth 2 1/10 in head.

Head compressed, sides somewhat flattened; upper profile little more inclined, rather evenly convex to dorsal origin; width 2 1/10 in its length. Snout rather conic, width 7/8 its length. Eye elevated, close to upper profile, its center very slightly advanced from that of head center. Mouth broad, gape rather short, reaches about half way to eye. Maxillary concealed, reaches 3/5 to eye. Teeth well coalesced to form even cutting-edges, finer above and lower as about 6 closely fused series each side of mandible; above 8 external flaring canines, 4 each side, also each side front pair protrude obliquely down and forward and hind pair curve out and backward. Lips broad, extend well over teeth, covering at least 3/4 their extent. Tongue thick, fleshy, not free. Nostrils small, close together, front one with short filament and situated half an eye-diameter before eye; hind nostril closer to front nostril than to eye. Inner buccal folds moderate. Interorbital moderate, very slightly elevated convexly. Supraorbital chain with rather coarse channels transversely.

Gill opening extends forward opposite eye center. Gill rakers 2 + 12, slender, flexible, short, several of larger bifurcate, 1/3 of gill filaments, which 1 1/3 in eye. Pseudobranchiae nearly long as gill filaments. Isthmus broad.

Scales with 20 to 35 basal radiating striae, apical radiating striae 19 to 32. Scales disposed in rather even longitudinal rows; single row of smaller ones crowded out along dorsal and anal bases and 3 enlarged ones finally over basal 2/3 of caudal. Scales moderately large on breast. Cheek with 5 large scales forming single row, though not extending below to preopercle ridge. Axillary ventral scale 1/3 of fin. Tubes in lateral line long, slender, with 1 to 4 rather long branches.

Dorsal spines stiff, pungent, with moderate slender filament behind tip of each; fin origin before that of pectoral; first spine 3 2/3 in head, ninth 3. Soft dorsal inserted midway between hind eye edge and caudal base, rays graduated little shorter backward; first ray 2 1/3 in head. Anal inserted opposite soft dorsal, similar; third spine 3 1/2 in head; third ray 2 1/3. Caudal convex behind when expanded, less so retracted; 1 1/5 in head. Pectoral moderate, obtuse, 1 1/2 in head. Ventral reaches 2/3 to anal, 1 4/5 in head. Vent close before anal.

Color in alcohol pale brownish generally, dotted or blotched obscurely with paler. Markings very vairiable in size, pattern and distribution. Iris pale brownish. Branchiostegal membrane deep brown. Fins pale brown,

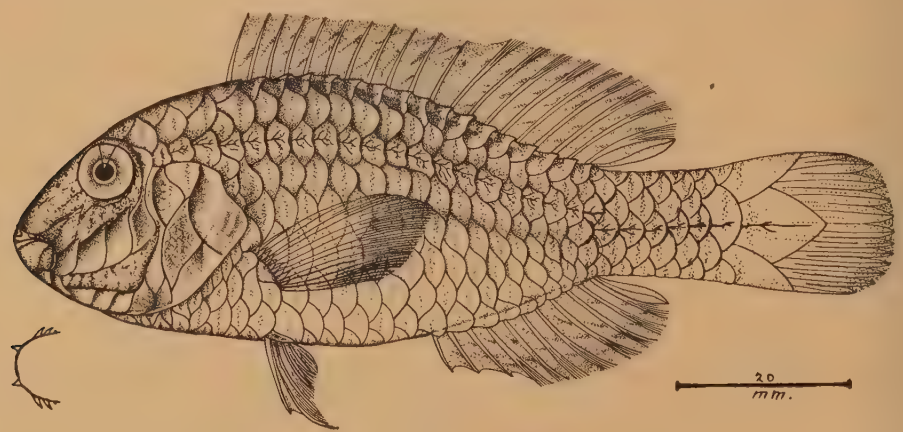

FIGURE 59.—Drawing of *Scaridea octodon*.

vertical ones with obscure dull brownish oblique streaks or blotches. Length 100 mm.

Type, No. 436, A. N. S. P. Hawaiian islands, J. K. Townsend.

Only the type known. Compared with the 2 Hawaiian specimens of *Scaridea zonarcha* obtained by the Wilkes Expedition, which are without the flaring external canines and have 2 rows of scales on the cheek. My specimen differs especially from the known species of *Scaridea* in the development of the anterior flaring canines. Its dentition more nearly approaches that of *Scarichthys coeruleopunctatus,* as shown in Bleeker's figure.

(Οκτω, eight; 'οδους, tooth; with reference to the upper flaring external canines.)

Scaridea zonarcha Jenkins.

Scaridea zonarcha Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 468, fig. 26, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op cit., vol. 23, pt. 1, p. 343, fig. 146, 1903 (1905) (types).—Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, pt. 4, p. 35, fig. 8, 1905 (1906) (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 29, 1925 (Honolulu).—Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., vol. 16, ser. 4, p. 675, 1927 (Honolulu).

Scaridea aerosa Jordan and Snyder: (U. S.) Bur. Fish., Bull., vol. 26, p. 215, fig. 4, 1906 (1907) (type loc., Honolulu).—E. K. Jordan: U. S. Nat. Mus., Proc., vol. 66, p. 27, 1925 (Honolulu).

Scaridea farrandi E. K. Jordan: U. S. Nat. Mus., Proc., vol. 66, p. 28, pl. 1, fig. 4, 1925 (type loc., Honolulu).

In the National Museum 2 from Oahu, obtained by the Wilkes Expedition. Also the types of *Scaridea zonarcha, Scaridea aerosa* and *Scaridea farrandi.* The Bishop Museum has 23 from Honolulu, largest 270 mm. I found 36 specimens in the Honolulu markets during December, 1922, and January, 1923. A comparison of this series shows variations in color-pattern far more extensive than may be gathered from the descriptions of either *Scaridea zonarcha, Scaridea farrandi* or *Scaridea aerosa.* The former appears to be the older or later stage, in which the post-pectoral golden or yellow band occurs, also with more or less red on the side of the head. In the young the 3 dark bands across the chin and the general pattern of the figure of *Scaridea zonarcha* Jenkins is carried out. Many of my smaller specimens are greatly mottled and with conspicuous black spots of variable size and disposition.

A comparison of the description of *Scaridea zonarcha* Jenkins, with his figure, reveals a discrepancy, in that the artist evidently has figured too many scales on the cheek and made them in 2 rows! Jenkins says "one row of 2 or 3 scales on cheek" and this has been copied by Jordan and Evermann along with the figure. It seems extremely likely *Scaridea balia* is simply a variant and that the absence of transverse dark chin bars and dark markings on the caudal and anal are possibly faded out. As for the white spots these are most always present in small or medium fresh specimens of *Scaridea zonarcha.* Their intensity or otherwise may well be according to conditions in preservation. Most all of the notes on color were evidently made from alcoholic materials by Jenkins, as he does not mention any colors of fresh specimens. Most of my alcoholics do not show any traces of the white spots.

Leptoscarus moluccensis (Bleeker).

Callyodon moluccensis Bleeker: Atlas ichth., vol. 1, p. 12, pl. 2, fig. 1, 1862 (type loc., Badjoa; Tombariri, Celebes; Ternate; Lebuka, Batjan; Kupang, Timor; Amboina; Wahaai, Ceram; Neira and Lanthoir, Banda).—Günther: Cat. fishes Brit. Mus., vol. 4, p. 216, 1862 (Aneiteum).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 276, 1883 (Hood Bay, New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 302, 1909 (type; Aneiteum).

Callyodon molluccensis Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Savay).

Leptoscarus moluccensis Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 377, 1928 (Vavau).

Scarichthys caeruleopunctatus (non Rüppell) Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 304, 1911 (Vavau, Tonga Islands).

Head 3; depth 3 to 3 1/2; D. IX, 10, 1; A. II, 9, 1 or 10, 1; tubular scales 19 or 20, 4 or 5 in lateral line to caudal base and 2 more on latter; 2 scales above, 5 below, 4 predorsal; snout 2 3/4 to 3 1/6 in head; eye 4 1/2 to 5 1/8; maxillary 3 7/8 to 4; interorbital 4 1/2 to 4 4/5.

Body compressed, elongately ovoid. Caudal peduncle strongly compressed, least depth equals its length or 2 1/5 to 2 3/4 in head.

Head width 1 9/10 to 2 in its length. Snout conic, long as wide. Eye elevated, hind edge midway in head length; diameter 1 2/5 to 1 3/4 in snout, 1 to 1 1/3 in interorbital. Mouth horizontal, jaws equal. Maxillary reaches opposite front nostril. Teeth conic; above in 3 series with outer flaring outward and last 1 or 2 each side as recurved canines; inner 2 rows of upper teeth rather irregularly close or together and well separated from outer row; lower teeth largely uniserial, somewhat compressed and only anteriorly as 2 irregular close pressed series. Front nostril at last fourth in snout; hind nostril close behind or little nearer front nostril than eye. Interorbital widely though only slightly convex. Gill rakers 3 + 9, short flexible points, some little bifurcate, 1/4 of gill filaments, which equal eye.

Scales with 13 to 15 basal radiating striae; apical 22 to 28; circuli very fine. Dorsal spines moderate, pungent, last 2 1/2 to 3 in head; first ray 2 1/6 to 2 5/6; second anal spine 3 1/4 to 5 2/3; third anal ray 2 7/8 to 3 3/5; caudal 1 1/4 to 1 2/5, rounded convexly behind; pectoral 1 1/2 to 1 3/4; ventral 1 7/8 to 2.

Mottled brown on back, paler below, even whitish underneath. Obscure pale spots scattered along back in 2 rather irregular rows. Back with 5 dark saddles, obscurely marbled and darker. Vertical fins pale, most spines and rays mottled with darker. Paired fins pale gray. Length 85 to 148 mm.

In the Agassiz Museum 1 from Vavau, Tonga Islands and 1 from Ponapé, Caroline Islands. In the National Museum 6 from Vavau, Tonga. 78 to 94 mm. long, as *Scarichthys caeruleopunc-*

tatus, which agree with Bleeker's description (Atlas ichth., vol. 1, pl. 2, fig. 1, 1862).

East Indies, Melanesia, Polynesia.

Leptoscarus viridescens (Rüppell).

Scarus (Calliodon) viridescens Rüppell: Neue Wirbelth. Fische, p. 23, pl. 7, fig. 2, 1835 (type loc., Djedda, Red Sea).

Leptoscarus viridescens Fowler: B. P. Bishop Mus., Bull. 38, p. 26, 1927 (Honolulu).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 378, 1928 (type of *Calotomus cyclurus*; Hawaii, Vavau).

Callyodon sandwicensis Valenciennes: Hist. nat. Poiss., vol. 14, p. 219, 1839 (type loc., Hawaiian islands).—Guichenot: Soc. Cherbourg, Mem., vol. 11, p. 62, 1865 (type).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 301, pl. 151, 1909 (Hawaiian islands).

Calotomus sandwicensis Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 512, 1900 (Hawaii).

Calotomus sandwichensis Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 16, 20, 21, 1902 (Honolulu).

Calotomus sandvicensis Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 467, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 341, 1903 (1905) (Honolulu; Kailua).—Fowler: Copeia, no. 112, p. 83, Nov. 1922 (Hawaii).

Leptoscarus sandvicensis Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 75, 1922 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 29, 1925 (Honolulu).

Calotomus cyclurus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 465, fig. 24, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 340, fig. 144, 1903 (1905) (type).

Scarichthys rarotongae Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 59, fig. 8, 1906 (type loc., Rarotonga, Cook Islands).

Scarichthys caeruleopunctatus (non Rüppell) Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 312, fig. 54, 1905 (1906) (Samoa).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 304, 1911 (Vavau, Tonga Islands).

Head 2 7/8 to 3 1/4; depth 2 1/3 to 2 2/3; D. IX, 10, 1 [in the type of *Scarichthys rarotongae* not X, 10, as Seale gives]; A. III, 9, 1 or II, 10, 1; scales 18 or 19, 4 or 5 in lateral line to caudal base and 2 more on latter; 1 or 2 scales above lateral line, 6 below, 4 or 5 predorsal; snout 2 7/8 to 3 1/4 in head; eye 3 7/8 to 5 1/2; maxillary 3 1/3 to 4; interorbital 4.

Head width 2 to 2 1/3 in its length. Snout conic, long as wide. Upper outer teeth forward 16 to 19, in posterior lateral series 10 or 12 each side; also in young 2 inner conic small teeth forward; 7 to 10 broad front lower teeth, front lower lateral series 4 or 5, median lateral series 5 to 7 and posterior series 3 or 4 very small teeth. Interorbital broadly convex. Gill rakers 5 + 12, short, slender, flexible, 1/4 of gill filaments, which equal eye. Scales with 28 to 32 basal radiating striae, with median basal lobe, apical striae 66 to 100. Tubes in lateral line with 3 or 4 branches. Single row of large cheek scales. First dorsal spine 2 2/5 in head; first dorsal ray 2 1/4; third anal spine 3 1/2; first anal ray 2 4/5; caudal 1 1/4; pectoral 1 1/2; ventral 1 5/6.

Brown, mottled darker, more or less as obscure fine vermiculations. On side 2 or 3 rows of pale spots not quite large as eye. Teeth white. Iris pale yellowish. Dorsals pale brownish, barred obliquely with darker and neutral-dusky blotch at bases of last rays. Anal like dorsals, but with neutral tint basally on most of fin. Caudal slightly convex as expanded, concave contracted, hind edge narrowly whitish, fin pale olive-brown with 4 or 5 irregular obscure vertical brown bands. Pectoral pale olivaceous, base and axil nearly seal-brown. In long preserved small specimens each scale with dull brown vertical bar. They also show traces of a dark blotch terminally on membrane between first and second dorsal spines.

In the Bishop Museum 4 from Honolulu and the type of *Scarichthys rarotongae*. Largest 216 mm. I found 8 in the Honolulu markets in December, 1922. The type of *Scarichthys rarotongae* is 87 mm. long and is smaller than any specimen I have seen. It shows the black pectoral blotch and the white hind caudal edge, the black spot on the first membrane of the spinous dorsal. Its inclusion extends the range of the species into Polynesia, heretofore not known outside Hawaii. The rounded caudal I take as a condition of youth. The Academy has 3 Hawaiian specimens, of which 2 received through J. K. Townsend. The National Museum has 1 from Maui and 1 from Oahu, obtained by the Wilkes Expedition. Also the type of *Calotomus cyclurus*, 2 other Hawaiian specimens, besides 1 from Vavau, Tonga, as *Scarichthys caeruleopunctatus*.

The figure of a young scaroid, identified by Jordan and Seale as *Scarichthys caeruleopunctatus* agrees in so many striking ways with the Rarotonga specimen I have placed it with *Leptoscarus viridescens*. The teeth are said to be "generic" and the same statement would carry the inference that the dorsal spines are flexible. This specimen I have not seen. Günther's figure of this species shows a decidedly narrower row of scales on the cheek than my specimen, which in this respect agrees better with Jenkins' figure of *Calotomus irradians*. Jordan and Evermann give the dorsal X, 11, and anal II, 9, but all my specimens show the formula in my description.

Red Sea, Zanzibar, East Africa, East Indies, Polynesia, Hawaii.

Leptoscarus carolinus (Valenciennes).

Callyodon carolinus Valenciennes: Hist. nat. Poiss., vol. 14, p. 216, 1839 (type loc., Caroline Islands).—Guichenot: Soc. Cherbourg, Mem., vol. 11, p. 61, 1865 (type).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).—Elera: Cat. fauna Filipinas, vol. 1, p. 558, 1895 (Carolines).

Calotomus snyderi Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 467, fig. 25, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 342, fig. 145, 1903 (1905) (type).

Callyodon snyderi Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 302, 1909 (Tahiti).

Membrane between first and second dorsal spines blackish; row of 5 roundish white spots large as pupil above lateral line and below 10 to 12 large round white spots; pectoral base and axil dusky. Length 243 mm.

Type of *Calotomus snyderi* in the National Museum examined.

East Indies, Micronesia, Polynesia, Hawaii.

Leptoscarus brachysomus (Bleeker).

Callyodon brachysoma Bleeker: Akad. Wet. Amsterdam, Verslagen, vol. 12, p. 244, 1861 (type loc., Amboina; Ternate) (no description).—Bleeker: Atlas

ichth., vol. 1, p. 14, pl. 2, fig. 3, 1862 (types).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Kandavu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 589, 1882 (New Guinea).

Scales along dorsal bases moderately elevated. Brown, irregularly spotted or dotted paler; blackish blotch at front of spinous dorsal; pectoral pale, base dark brown. Length 150 mm. (Bleeker)

Apparently differs from *Leptoscarus carolinus* chiefly in the elevated scales along the bases of the dorsal fins.

East Indies.

Leptoscarus vaigiensis (Quoy and Gaimard) (Pl. XLII, *A*).

Scarus vaigiensis Quoy and Gaimard: Voyage "Uranie," Zool., p. 288, 1824 (type loc., Waigiu).—Valenciennes: Hist. nat. Poiss., vol. 14, p. 158, 1839 (Waigiu).

Callyodon waigiensis Valenciennes: Hist. nat. Poiss., vol. 14, p. 220, 1839 (Waigiu).

Leptoscarus wargiensis Swainson: Nat. hist. Animals, vol. 2, p. 226, 1839 (on Quoy and Gaimard).

Leptoscarus vaigiensis Fowler: B. P. Bishop Mus., Bull. 38, p. 25, 1927 (Honolulu).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 380, 1928 (Hawaii).

Pseudoscarus wageensis Bleeker: Atlas ichth., vol. 1, p. 49, 1862 (copied).

Scarichthys waigiensis Guichenot: Soc. Cherbourg. Mem., vol. 11, p. 18, 1865 (type).

Scarus spinidens Quoy and Gaimard: Voyage "Uranie," Zool., p. 289, 1824 (type loc., Waigiu) (same type as *Scarus vaigiensis*).

Callyodon spinidens? Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 276, 1883 (Hula, Hood Bay, New Guinea).—?Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 509, 1901 (Laysan).

Callyodon genistriatus Valenciennes: Hist. nat. Poiss., vol. 14, p. 218, 1839 (no type locality).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 509, 1901 (Honolulu).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 300, pl. 150, 1909 (Ponapé, New Britain, Upolu, Tahiti, Fiji).

Calotomus irradians Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 58, fig. 15, 1899 (1900) (type loc., Honolulu).—Jenkins: op. cit., vol. 22, p. 467, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 339, fig. 143, 1903 (1905) (Honolulu).

Leptoscarus irradians Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 74, Dec. 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 29, 1925 (Honolulu).

Calotomus sandvicensis (part) Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 341, 1903 (1905) (Hawaii).

Head 3 to 3 1/4; depth 2 1/5 to 2 1/2; D. IX, 10, 1; A. III, 9, 1; scales 18 in upper section of lateral line, 3 or 4 in lower section and 3 more on caudal base; 2 scales above lateral line, 6 below; 4 predorsal scales; snout 2 1/3 to 2 2/5 in head; eye 8 1/6 to 8 1/2; maxillary 3 3/4 to 4; interorbital 3 5/6 to 4.

Least depth of caudal peduncle 1 9/10 to 2 2/5 in head. Head width 1 2/3 to 2 in its length. Snout convex, width at front of eyes equals its length in profile. Upper teeth in 14 rows, lower in 28 to 30 rows. Upper posterior canines 1 or 2 left, 1 right; no lower canines. Interorbital evenly convex. Cheek with single row of 3 or 4 scales. First dorsal spine 2 3/4 to 2 5/6 in head; last spine 3 to 3 1/2; ninth dorsal ray 2 1/8 to 2 1/4; third anal spine 4 to 4 1/3; eighth anal ray 2 to 2 3/5; caudal 1 1/10 to 1 1/4; pectoral 1 1/3 to 1 1/2; ventral 1 3/4 to 2.

Dark brown generally, but little paler below. About 9 radiating dark bands from eye, lower down across cheek. Pale band across mandible. Vertical fins dark to dusky-brown. Pectoral and ventral brown, hind edge of former broadly pale. Iris dull slaty. Teeth white.

In the Bishop Museum 3 from Honolulu, 389 to 500 mm. long. The pale hind pectoral edge is shown very well in Garrett's figure, published by Günther. In my smallest specimen base of pectoral dusky. The broad cheek scales are present in all. I examined 6 specimens in the Honolulu markets in December, 1922. In the Agassiz Museum 12 Hawaiian specimens, 1 from the Kingsmill Islands and 1 from the Society Islands, obtained by Andrew Garrett. Also 1 from Vavau. In the National Museum 1 specimen 358 mm. long, Hawaiian, as *Calotomus sandvicensis*.

Callyodon perspicillatus (Steindachner).

Scarus perspicillatus Steindachner: Akad. Wiss. Wien, Denk., vol. 41, p. 16, pl. 4, fig. 1, 1879 (type loc., Hawaiian islands).—Smith and Swain: U. S. Nat. Mus., Proc., p. 134, 1882 (Johnston Island).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 470, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 531, 1902 (1904) (Puako Bay).—Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 4, p. 31, fig. 6, 1905 (1906) (Honolulu).

Callyodon perspicillatus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 347, fig. 149, 1903 (1905) (Honolulu).—Jordan and Snyder: (U. S.) Bur. Fish., Bull., vol. 26, p. 216, pl. 13, 1906 (1907) (Honolulu).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 29, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 25, 1925 (Lisiansky, Laysan, French Frigates Shoal, Johnston islands).

Pseudoscarus perspicillatus Günther: Mus. Godeffroy. Jour., vol. 8, pt. 16, p. 321, 1909 (Hawaiian islands).

Scarus oviceps (non Valenciennes) Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 512, 1900 (Hawaiian islands; part).

Scarus leucostigma Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., vol. 16, ser. 4, p. 676, pl. 24, fig. 2, 1927 (type loc., Honolulu).

Head 2 4/5 to 3 1/4; depth 2 1/3 to 3; D. IX, 10, 1 or 11, 1; A. III, 9, 1; scales 17 or 18 in upper section of lateral line, 5 or 6 in lower section and 2 on caudal base; 1 or 2 scales above lateral line, 5 or 6 below; 3 to 5 predorsal scales; snout 2 1/8 to 2 3/5 in head; eye 6 1/5 to 9 3/4; maxillary 4 to 5 1/3; interorbital 2 to 2 2/5.

Head width 2 to 2 1/8 in its length, upper profile slightly concave over nostrils, strongly gibbous and convexly swollen in adult. Snout wide as long. Upper lip about covers half of teeth. No posterior canines. Interorbital convexly elevated. Gill rakers 23+32, slender, flexible, 1/4 of gill filaments, which 5 2/5 in head. Scales with 30 to 38 basal radiating striae; apical striae 34 or 35. Cheek with 2 rows of scales, though lower usually of but 2 scales, sometimes absent. Slender tubes of lateral line with 2 or 3 short branchlets. First dorsal spine 3 to 3 1/6 in head; seventh dorsal ray 2 2/5 to 2 4/5; third anal spine 3 3/5 to 4; eighth anal ray 2 1/2 to 2 7/8; caudal 1 1/5 to 1 2/5; pectoral 1 1/4 to 1 2/5; ventral 1 4/5 to 1 7/8.

More or less uniform dull brown, scarcely paler below. Adult with slaty-blue band across snout, down well below eye, with border-line blue-green. Blue-green line connects eyes. Another obliquely down towards lower pectoral base. Lower lip broadly whitish and spots and lines of blue-green on lower cheek and lower

side of head. Predorsal and front of back blue-green, also edges and bases of dorsals, besides row of median blotches on soft fin. Anal with 2 longtitudinal green bands. Pectoral and caudal brown, former with upper green band. Caudal convex expanded, truncate retracted and hind edge very narrowly whitish. Ventral with green line in front and along hind edge.

The Academy with 2 specimens from the Hawaiian islands, both through J. K. Townsend, one 218 mm. and dry skin 575 mm. Both show the frontal pale-edged band, so prominent in Steindachner's figure. In the dry specimen there are 2 rows of cheek scales, though the lower row has only 1 or 2 scales. The squamous area covers less than half the cheek area below the infraorbital. This specimen is interesting historically as having been secured by Townsend long before the species was described by Steindachner. The Bishop Museum has 4 from Honolulu, largest 623 mm. I examined 76 specimens in the Honolulu markets in November and December, 1922. Two from Lisiansky, 1 from French Frigates Shoal and 1 Johnston Island in 1923. In the National Museum 3 Hawaiian specimens and 1 from Johnston Island. In the Agassiz Museum 2 Hawaiian specimens obtained by Andrew Garrett.

Callyodon ahula (Jenkins).

Scarus ahula Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 61, fig. 19, 1899 (1900) (type loc., Honolulu).—Jenkins: op. cit., vol. 22, p. 470, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 531, 1902 (1904) (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 75, 1922 (Hawaii).—Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., vol. 16, ser. 4, p. 678, 1927 (Hawaii).

Callyodon ahula Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 351, fig. 152, 1903 (1905) (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 25, 1925 (Lisiansky).

Scarus miniatus Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 62, fig. 20, 1899 (1900) (type loc., Honolulu).—Jenkins: op. cit., vol. 22, p. 470, 1902 (1903) (Honolulu).

Callyodon miniatus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 346, fig. 148, 1903 (1905) (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 25, 1925 (French Frigates Shoal and Johnston Island).

Head 3 1/8; depth 2 3/4; D. IX, 10, 1; A. III, 9, 1; scales 17 in upper section of lateral line, 4 in lower section to caudal base and 2 more on latter; 2 scales above, 6 below, 4 predorsal; snout 2 1/10 in head; eye 6 1/3; mouth cleft 5 3/4; interorbital 2 2/3.

Body ovoid, rather deep, compressed. Caudal peduncle well compressed, length equals 1 2/5 in least depth, which 2 1/10 in head.

Head width 2 in its length. Snout conic, convex over surface in profile; width 1 1/4 in its length. Eye with hind pupil edge midway in head; diameter 2 7/8 in snout, 2 1/4 in interorbital. Mouth cleft 2 3/4 to eye. Lips largely cover teeth. No canines. Nostrils small, well separated; front one at last fourth in snout; hind one elevated, little nearer front one than eye. Interorbital broadly convex. Gill rakers 20+35, short, flexible, slender, 4 2/3 in gill filaments, which 2 1/3 in snout.

Scales with 30 to 38 basal radiating striae, edge trilobate; apical 38 or 39; circuli very fine. Cheek with 2 rows of scales, lower row smaller and not reaching preopercle ridge, of 4 scales. Tubes in lateral line slender, with 2 or 3 short branchlets. First dorsal spine 2 2/5 in head; first dorsal ray 2 1/5; third anal spine 2 7/8; first anal ray 2 3/5; caudal 1 2/5, little convex behind; pectoral 1 1/4; ventral 1 2/3.

Largely uniform brownish, with slight traces of darker longtitudinal bands, following in scale junctures. Fins uniform brown. Length 205 mm.

In the Agassiz Museum 1 from the Hawaiian islands obtained by Andrew Garrett. It differs a little from Jordan and Evermann's figure in that the caudal is slightly convex behind. Also 1 of 434 mm., same data. One in the Bishop Museum from Honolulu. One from French Frigates Shoal, 2 from Johnston Island and 3 from Lisiansky Island in 1923. Three in the National Museum from Honolulu.

Differs from *Callyodon perspicillatus* only in its uniform brown coloration.

Callyodon erythrodon (Valenciennes).

Scarus erythrodon Valenciennes: Hist. nat. Poiss., vol. 14, p. 189, 1839 (type loc., Mauritius).

Pseudoscarus erythrodon Schmeltz: Mus. Godeffroy, Cat. 6, p. 17, 1877 (Yap).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 319, 1909 (Pelew Islands, Yap, New Hebrides, Marquesas, Samoa, Raiatea, Tahiti).

Callyodon erythrodon Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1400, 1906 (Savaii).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 62, 1906 (Tahiti, Rarotonga, Faté).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 30, 35, 1925 (Honolulu; Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 26, 1925 (French Frigates Shoal, Johnston and Wake islands).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 385, 1928 (Apra Bay on Guam).

Scarus sumbawensis Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 5, 1859 (Doreh, New Guinea).

Pseudoscarus sumbavensis Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Samoa).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 37, 1885 (Rubi, New Guinea).

Pseudoscarus sumbawensis Steindachner: Akad. Wiss. Wien, Denk., vol. 41, pt. 1, p. 19, 1879 (Society Islands).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 97, 1900 (Guam).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 509, 1901 (Laysan).

Pseudoscarus gymnognathus Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1859 (Kandavu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 590, 1882 (New Guinea).

Pseudoscarus goldiei Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 590, 1882 (type loc., New Guinea).

Pseudoscarus platodoni Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 96, 1900 (type loc., Agaña, Guam).

Callyodon lacerta (non Valenciennes) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 60, 1906 (Shortland Island, Solomon Islands).

Callyodon pyrrhostethus (non Bleeker) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 60, 1906 (Rarotonga; not Faté specimen).

Callyodon balinensis (non Bleeker) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 60, 1906 (Shortland Island; part).

Head 2 2/3 to 2 7/8; depth 2 3/5 to 2 4/5; D. IX, 10, 1; A. III, 9, 1; scales 18 in upper section of lateral line, 5 or 6 in lower section and 2 on caudal base; 2 scales above lateral line, 6 below; 4 or 5 predorsal scales; snout 2 3/5 to 3 1/8 in head; eye 4 1/2 to

6 4/5; maxillary 4 1/4 to 4 2/5; interorbital 2 4/5 to 3 1/8.

Head width 2 1/3 to 2 7/8 in its length. Snout well convex, length 7/8 to 1 in its width. Lips completely cover teeth; only 1 or 2 posterior upper canines either side and even sometimes absent. Gill rakers 18+30, short, slender, flexible, 3 1/2 in gill filaments or 6 1/2 in head. Scales with 34 to 38 basal radiating striae, apical 42 to 44. Cheek with 2 rows of scales, none on preopercle flange. Tubes in lateral line simple, with 1 or 2 short branchlets.

Nearly natal-brown, scarcely paler below. Scattered darker and paler obscure dots or blotches. Vertical fins natal-brown, edges of soft dorsal, emarginate caudal and anal, very narrowly whitish. Pectoral and ventral pale. Young darker, caudal truncate when retracted, convex behind when expanded and though rayed vertical fins with white edges fins themselves much darker. Length 68 to 222 mm.

Two in the Academy from Pago Pago. The Bishop Museum has 1 from Tahiti, 1 Raiatea, 2 Rarotonga of which 1 as *Callyodon pyrrhosthus,* 3 from Agaña on Guam with 1 as type of *Pseudoscarus platodoni,* 3 Faté with 1 as *Callyodon dussumieri,* 3 Shortland Island of which 2 as *Callyodon aeruginosus* and 1 as *Callyodon baliensis* and 2 from Honolulu, of which 1 from W. A. Bryan in 1915. One from French Frigates Shoal, 4 Johnston Island, and 1 Wake Island in 1923. I found 132 specimens in the Honolulu markets during December, 1922, and January, 1923. The National Museum has 2 from Tahiti through William Stimpson. In the Agassiz Museum 9 from Pago Pago and 1 from the Society Islands obtained by Andrew Garrett.

Scarus cruentatus Valenciennes (Hist. nat. Poiss., vol. 14, p. 206, 1839, type loc., Uléa) is briefly described and really may be this species. The original description is condensed as follows: Teeth notched, rose-color, marbled with longitudinal reddish streaks. Head above and before eyes, in middle of each scale, with spots of deep blood color. This tint also on caudal and opercle in rounded points. Caudal rounded at angles. Dorsal and anal with rays carmine red and membranes red or somewhat orange. Ventral and pectoral deep red. Length 112 mm. *Pseudoscarus goldiei* is described with but 2 rows of scales on the cheek, jaws whitish or rosy and body dull purple, pinkish under head. Length 176 mm.

Zanzibar, East Africa, Mauritius, India, Ceylon, East Indies, Melanesia, Micronesia, Polynesia, Hawaii.

Callyodon erythacus Jordan and Seale.

Callyodon erythacus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 318, fig. 58, 1905 (1906) (type loc., Apia, Samoa).

Head 3; depth 2 2/3; D. IX, 10, 1; A. III, 9, 1; scales 17 in upper section of lateral line, 4 in lower section to caudal base and 2 more on latter; 2 scales above, 6 below, 5 predorsal; snout 2 1/2 in head; eye 6; maxillary 5; interorbital 3 1/10.

Body deeply compressed, elongately ovoid. Caudal peduncle strongly compressed, long as deep and least depth 2 1/4 in head.

Head width 2 1/8 in its length. Snout conic, long as wide. Eye with hind pupil edge midway in head length; diameter 2 1/4 in snout, 2 in interorbital. Mouth small, cleft about 2/5 to eye. Lips broad, nearly completely cover teeth. Single posterior canine above each side, none below. Front nostril at last third in snout; hind nostril little closer to front one than to eye. Interorbital convex. Gill rakers 17+23, flexible, 1/5 of gill filaments, which equal eye.

Scales with 31 to 42 basal radiating striae; apical radiating striae 74 to 91; circuli fine. Cheek with 2 rows of scales, of which 5 scales in lower row, preopercle limb naked. Dorsal spines rather pungent, first 3 1/3 in head; first dorsal ray 2 4/5; third anal ray 3 1/5; caudal 1 1/4, emarginate behind; pectoral 1 1/4; ventral 1 2/3.

Dull brown generally, each scale silghtly darker basally, especially on back. Chin little paler brown than snout, without dark crossbands. Iris brown. Back and fins with traces of slight olivaceous tinge, though all fins uniform, without distinct borders. Pectoral and ventral axils pale. Length 225 mm.

In the Agassiz Museum 1 from the Society Islands obtained by Andrew Garrett. In most ways it agrees with Jordan and Seale's description, from a slightly larger specimen. It does not show such a swollen snout anteriorly as indicated by their figure.

Possibly not distinct from *Callyodon erythrodon.*

Callyodon borborus (Jordan and Evermann).

Scarus barborus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 197, 1902 (1903) (type loc., Honolulu).

Callyodon borborus Jordan and Evermann: U. S. Fish Comm., vol. 23, pt. 1, p. 349, fig. 150, 1903 (1905) (type).—Fowler: B. P. Bishop Mus., Bull. 22, p. 29, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 25, 1925 (Wake Island).

Uniform gray-brown. No posterior canines. Cheek with 2 rows of scales, 5 in upper row and 2 to 4 in lower row and these posterior. Length 197 mm.

Type of *Scarus borborus* from Honolulu, in the National Museum examined.

Perhaps not different from *Callyodon erythrodon.*

Callyodon celebicus (Bleeker).

Scarus celebicus Bleeker: Nat. Tijds. Ned. Ind., vol. 7, p. 253, 1854 (type loc., Makassar).

Callyodon celebicus Fowler: B. P. Bishop Mus., Bull. 22, p. 15, 1925 (Guam).

Callyodon dussumieri (non Valenciennes) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 62, 1906 (Faté, New Hebrides).

Head 2 1/2; depth 2 3/4; D. IX, 10, 1; A. III, 9, 1; scales 17 in upper section of lateral line, 4 in lower section and 2 on caudal base; 2 scales above lateral line, 6 below; 4 predorsal scales; snout 2 1/5 in head; eye 7; maxillary 3 7/8; interorbital 2 9/10.

Body rather deeply fusiform, well compressed. Least depth of caudal peduncle 2 3/4 in head. Head width 2 1/6 in its length. Snout convex, width 1 1/5 in its length. Eye midway in head length. Upper lip covering half of teeth; no distinct posterior canines, which $\frac{2\text{-}1}{0\text{-}0}$ obsolete tubercles. Nostrils alike, separated, small

pores. Interorbital broadly convex. Gill rakers 16+30, slender, flexible, 1/4 of gill filaments, which equal eye. Scales with 41 apical denticles, basal parallel striae 28. Cheek with 2 rows of scales, with 6 scales in lower row and none on preopercle flange. First dorsal spine 2 7/8 in head; first dorsal ray 2 7/8; ninth dorsal ray 3 7/8; third anal spine 3 1/2; eighth anal ray 3 3/5; caudal length 1 9/10; pectoral 1 3/5; ventral 2 1/8.

Dull brown generally. Dorsals with broad greenish marginal line or band. Anal with dark median line sloping slightly more towards margin posteriorly. Caudal truncate, upper and lower edges darker, each with submarginal paler band. Pectoral and ventral dull brown. Teeth greenish. Length 215 mm.

One in the Bishop Museum from Faté. It agrees in many respects with Bleeker's figure of *Pseudoscarus celebicus* (Atlas ichth., vol. 1, pl. 15, fig. 2, 1862), except it does not show traces of the green line on each lip and 2 behind the eye, also there is no trace of the blue median band on the soft dorsal and terminal or marginal blue band on the caudal. One from Guam in 1923.

East Indies, Melanesia.

Callyodon brunneus (Jenkins).

Scarus brunneus Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 59, fig. 16, 1899 (1900) (type loc., Honolulu).—Jenkins: op. cit., vol. 22, p. 470 1902 (1903) (Honolulu).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 304, 1911 (Kambara, Fiji; Jaluit, Marshalls).

Callyodon brunneus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 349, fig. 151, 1903 (1905) (Honolulu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 318, 1905 (1906) (Apia).—Fowler: B. P. Bishop Mus., Bull. 22, p. 30, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 25, 1925 (Wake Island).

Callyodon dubius (non Bennett) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 59, 1906 (Raiatea, Society Islands).

Head 3; depth 2 4/5; D. IX, 10, 1; A. III, 9, 1; scales 17 in upper section of lateral line, 5 in lower section and 2 on caudal base; scales 2 above lateral line, 6 below; 4 predorsal scales; snout 2 1/2 in head; eye 5 1/3; maxillary 4 1/3; interorbital 3 2/5.

Body elongately ovoid, well compressed. Least depth of caudal peduncle 2 1/10 in head. Head width 2 1/4 in its length. Snout conic, with slight depression in upper profile just before eye; width 1 1/5 in its length Eye with hind edge slightly behind center in head length. Lips broad, cover most of teeth. No posterior canines. Nostrils small, alike. Interorbital convex. Scales with 31 basal radiating striae; apical parallel striae 37. Cheek with 2 rows of scales, of which 4 scales in lower row and none on preopercle flange. Caudal 1 2/5 in head, hind edge slightly emarginate; pectoral 1 1/3; ventral 1 3/4. Faded nearly uniform dull brown in alcohol. Length 195 mm.

In the Bishop Museum 1 in poor condition from Raiatea. One from Wake Island in 1923. The National Museum has 2 Hawaiian specimens, type of *Callyodon brunneus*, 1 from Kambara in Fiji and 2 from Jaluit. In the Agassiz Museum 1 from Kambara 216 mm. long.

Callyodon moensi (Bleeker).

Scarus moensi Bleeker: Soc. Sci. Ind. Neerl., Act. (Celebes), vol. 9, p. 54, 1860 (type loc., Badjoa, Celebes).

Callyodon moensi Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 63, 1906 (Tahiti; not Faté material).

Head 2 3/4; depth 3; D. IX, 10, 1; A. III, 9, 1; scales 17 in upper section of lateral line, 5 in lower section and 1 on caudal base; 2 scales above lateral line, 6 below; 4 predorsal scales; snout 2 2/5 in head; eye 6 2/3; maxillary 4 1/4; interorbital 3 1/5. Least depth of caudal peduncle 2 1/4 in head. Head width 2 1/8 in its length. Upper lip covers most of upper jaw, about 2/3. Cheek with 2 rows of scales, lower of 6 scales, none on preopercle flange. First dorsal spine 2 4/5 in head; last spine 3; ninth dorsal ray 3; third anal spine 4; eighth anal ray 3; caudal emarginate, lobes end in points, fin 1 2/5; pectoral 1 1/2; ventral 1 7/8. Dorsal spines flexible. Dull brown generally. Dorsal with indistinct dark marginal line. Teeth white. Iris slaty.

Three specimens, 218 to 248 mm. from Tahiti, in the Bishop Museum, with posterior canines $\frac{2\text{-}1}{0\text{-}0}$, $\frac{2\text{-}1}{0\text{-}0}$, $\frac{1\text{-}1}{0\text{-}0}$

Callyodon margaritus (Cartier).

Pseudoscarus margaritus Cartier: Physik. med. Ges Wurzburg, Verh., vol. 5, p. 105, 1874 (type loc., Cebu)

Two specimens in the National Museum, 215 to 228 mm. long, from New Guinea. Both have the teeth well exposed; canines $\frac{1\text{-}1}{0\text{-}0}$, very small; cheek scales in 2 rows and none on preopercle flange. They also show a conspicuous brown round blotch at the caudal base and more or less distinct whitish spots in about 5 vertical rows.

Known only from the East Indian region.

Callyodon sordidus (Forskål) (Pl. XLII, *B*).

Scarus sordidus Forskål: Descriptiones animalium, pp. x, 30, 1775 (type loc., Arabia).

Pseudoscarus sordidus Steindachner: Akad. Wiss. Wien, Denk., vol. 41, pt. 1, p. 19, 1879 (Society Islands).

Callyodon sordidus Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 26, 1925 (Johnston and Wake islands).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 398, 1928 (type of *C. pyrrhurus*, *C. abacurus* and *C. cyanogrammus*).

Scarus purpureus (non Forskål) Valenciennes: Hist. nat. Poiss., vol. 14, p. 206, 1839 (type loc., Uléa).

Callyodon purpureus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 316, fig. 57, 1905 (1906) (Apia).

Scarus troscheli Bleeker: Nat. Tijds. Ned. Ind., vol. 4, p. 498, 1853 (type loc., Batavia, Java).

Pseudoscarus troscheli Schmeltz: Mus. Godeffroy, Cat. 5, p. 34, 1874 (Upolu).

Pseudoscarus troschelli Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 38, 1885 (Rubi, New Guinea).—Waite: Australian Mus., Mem., no. 3, p. 194, 1897 (Funafuti, Ellice Islands).

Pseudoscarus troschelii Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 508, 1901 (Laysan).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 328, 1909 (South Sea).

Callyodon troscheli Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 384, 1923 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 35, 1925 (Samoa).

Scarus celebicus (non Bleeker) Steindachner: Akad. Wiss. Wien, Denks., vol. 41, pt. 1, p. 19, 1879 (Society Islands).

Scarus celebricus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 95, 1900 (Agaña, Guam).

Callyodon celebicus Seale: B. P. Bishop Mus., Occ.

Papers, vol. 4, no. 1, p. 60, 1906 (Rarotonga, Cook Islands).

Pseudoscarus troschelii var. *flavoguttata* Steindachner: Akad. Wiss. Wien, Stiz., vol. 96, pt. 1, p. 63, 1887 (1888) (type loc., Kingsmill Islands).

Scarus bataviensis (non Bleeker) Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 508, 1901 (Honolulu).

Callyodon bataviensis Fowler: B. P. Bishop Mus., Bull. 22, p. 30, 1925 (Honolulu).

Pseudoscarus vitriolinus Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 4, p. 27, fig. 4, 1905 (1906) (type loc., Honolulu).

Callyodon pyrrhurus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 314, fig. 55, 1905 (1906) (type loc., Apia and Pago Pago, Samoa).

Callyodon abacurus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 324, pl. 33, 1905 (1906) (type loc., Apia and Pago Pago).

Pseudoscarus abacurus Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 329, 1909 (Yap, Pelew Islands, Samoa, Kingsmills, Tonga, Society Islands, Paumotus); op. cit., vol. 9, pt. 17, pl. 162, 1910.

Callyodon cyanogrammus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 330, fig. 63, 1905 (1906) (type loc., Apia, Samoa).

Head 2 3/5 to 2 2/3; depth 2 3/5 to 2 4/5; D. IX, 10, 1, abnormally X, 6; A. III, 9, 1 or 8, 1; scales 16 to 18 in upper section of lateral line, 5 or 6 in lower section and 2 on caudal base; 2 scales above lateral line, 6 or 7 below; 3 predorsal scales; snout 2 1/5 to 2 1/3 in head; eye 8 3/4 to 11; maxillary 4 1/5 to 4 3/5; interorbital 2 3/5 to 3.

Least depth of caudal peduncle 2 1/2 to 2 3/5 in head. Head width 2 to 2 1/10 in its length. Upper lip covers half of teeth. Strong upper posterior protruding canine each side, sometimes 2 weak upper ones each side. Interorbital broadly and evenly convex. Gill rakers 30+33, slender, flexible, 4 1/2 in gill filaments, which 1/6 of head. Scales with 34 basal radiating striae and edge with median lobe; 51 special radiating striae. Cheek with 2 rows of scales. Tubes in lateral line slender, with 1 or 2 short branches. First dorsal spine 4 in head; first dorsal ray 3 1/8 to 3 1/4; third anal spine 4 1/3 to 4 4/5; fifth anal ray 3 1/3 to 3 2/5; caudal 1 3/5 to 1 4/5; pectoral 1 2/5 to 1 1/2; ventral 2.

Dull or nearly uniform brown, but slightly paler below. Green line from upper canine to eye, then back slightly over postorbital, above which another similarly short. Lips edged buff, though upper with green line submarginal and another leaves lower lip broadly buff each side. Green line starts from rictus and extends up to upper green line, joining about middle of preorbital. Dorsals and anals pale yellowish-brown, marginally and basally each with pale greenish band. Caudal and pectoral dark brown. Ventral pale brown.

In the Bishop Museum 5 from Honolulu, 1 Agaña on Guam, 1 Makatea and 1 Rarotonga. Largest 396 mm.

Two of the Hawaiian specimens largely uniform brown; dorsals with very narrow pale edges, median yellow band and broader basal band, intervening areas gray; anal pale, broad yellow band basally; teeth green; iris slaty; no scales on preopercle flange and caudal very slightly emarginate, truncate when expanded. The 2 larger Hawaiian examples show head largely greenish-blue; pectoral and caudal green; also borders and bases of dorsals and most of anal; middle of dorsals with longitudinal brownish line; pectoral pale brown, front edge green; lips pale; teeth green; 4 or 5 scales in lower row on cheek.

In the Agaña specimen the color-pattern remaining is suggestive of Jordan and Seale's figure of *Callyodon abacurus;* 2 obsolete left and 1 right upper posterior canines. Two from Johnston Island and 1 from Wake Island in 1923. In the National Museum types of *Callyodon abacurus, Callyodon cyanogrammus, Callyodon pyrrhurus* and 2 from Apia 112 to 228 mm. The Agassiz Museum has 7 from the Society Islands obtained by Andrew Garrett. One in the Academy from Apia.

Possibly *Scarus festivus* Valenciennes (Hist. nat. Poiss., vol. 14, p. 210, 1839, no type locality) is synonymous. It is described as follows:

D. IX, 10; A. III, 8; C. 13; P. 13; V. I, 5. Neck elevated, with snout protruded. Caudal forked. Lips rosy, bordered green and behind a second band joins first from eye edge. From eye 2 green chevrons and another passes from the front. Diverse rosy rays extend nearly to the preopercle border. On front of head, between eye, green anterior chevron to front of lip deep blue. Neck, opercle and suborbital green. Back and belly white. Middle of sides yellow, with blue or green above, which forms green tint separating yellow of flanks. Dorsal and anal pale blue, with large median rosy band. Caudal rosy, with large vertical blue band and the 2 outer rays same color. Length 203 mm.

East Africa, Red Sea and Mauritius to India, the East Indies, China, Melanesia, Micronesia, Polynesia, and Hawaii.

Callyodon quoyi (Valenciennes).

Scarus quoyi Valenciennes: Hist. nat. Poiss., vol. 14, p. 203, 1839 (type loc., Cartaret Harbor, New Ireland).

Callyodon quoyi Seale: B. P. Bishop Mus., Occ. Papers, vol. 6, no. 1, p. 62, 1906 (Shortland Island, Solomons).

Pseudoscarus quoyi Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 319, 1909 (New Ireland, Ternate, Ponapé, Ruk Island).

Pseudoscarus viridis (non Bonnaterre) Guichenot: Soc. Cherbourg, Mem., vol. 11, p. 33, 1865 (types of *Scarus quoyi* Valenciennes).

Head 2 4/5; depth 2 3/4; D. IX, 10, 1; A. III, 9, 1; scales 17 in upper section of lateral line, 5 in lower section and 2 more on caudal base; 2 scales above lateral line, 6 below; 4 predorsal scales; snout 2 1/8 in head; eye 7 1/2; maxillary 4 1/4; interorbital 3 1/8.

Body elongately ovoid, deepest at middle of pectoral. Least depth of caudal peduncle 2 1/3 in head. Head width 2 1/3 in its length. Snout convex, width 1 2/5 in its length. Lips cover basal portions of teeth only. Each side 2 upper posterior canines. Nostrils small, similar, close together, near last fourth in snout. Interorbital evenly convex. Gill rakers 17+28, lanceolate, flexible, 1/5 of gill filaments, which 1/5 in total head length. Scales with 57 basal radiating striae, apical 44. Cheek with 2 rows of scales, none on preopercle flange. First dorsal spine 2 2/3 in head; first dorsal ray 2 1/4; third anal spine 3 1/4; first anal ray 2 5/6; caudal emarginate, median rays form slightly convex hind edge when expanded, fin 1 2/5; pectoral 1 1/5; ventral 1 3/5.

Dull brown, with olive tinge generally. Green line across each lip submarginally, uniting at rictus with one line curving up to lower eye edge, then back toward pectoral origin, other line across lower row of cheek scales, just below pectoral base. Dorsals buff, with greenish margin, basal line and median band their whole extent. Anal greenish, divided by median buff longtitudinal line. Caudal greenish, upper and lower edges little darker and with submarginal pale brown band above and below, each inside of upper and lower caudal lobes. Pectoral greenish, with upper submarginal brownish longitudinal band. Ventral brownish, front edge greenish. Iris dull slaty. Teeth pale. Length 311 mm.

One in the Bishop Museum from Shortland Island.

Possibly *Scarus ocellatus* Valenciennes (Hist. nat. Poiss., vol. 14, p. 306, 1839, type loc., Caroline Islands.—Kittlitz, Denkw. Reise Mikronesien, vol. 2, p. 160, 1858, Uléa), based on a drawing by Kittlitz and imperfectly noticed, may have been intended for this species. The spinous dorsal is said to be orange, edged black and with a clear black oval blotch, though this may have been a stain? It is also said to have a black vertical streak before the eye and a larger one obliquely from the neck across the opercle nearly to the breast below the pectoral. Length 140 mm.

East Indies, Melanesia, Micronesia.

Callyodon jonesi (Streets).

Pseudoscarus jonesi Streets: U. S. Nat. Mus., Bull. no. 7, p. 80, 1877 (type loc., Palmyra Island; Fanning Islands).

Callyodon jonesi Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 25, 1925 (Wake Island).—Fowler: op. cit., Bull. 38, p. 26, 1927 (Palmyra Island).

Scarus brighami Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 131, 1902 (1903) (type loc., Marcus Island).

Callyodon latax Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 329, pl. 49, 1905 (1906) (type loc., Apia, Samoa).

Head 2 3/4; depth 2 1/2; D. IX, 10, 1; A. III, 9, 1; P. 1, 13; V. I, 5; scales 17 in upper section of lateral line, 4 in lower section and 3 on caudal base; 2 scales above lateral line to spinous dorsal origin, 6 below to spinous anal origin; 4 predorsal scales; snout 2 1/10 in head; eye 8; maxillary 4 3/4; interorbital 3.

Body elongately ovoid, strongly compressed, profiles alike, edges rounded and deepest near end of depressed pectoral. Caudal peduncle well compressed, about long as deep, least depth 2 1/3 in head.

Head well compressed, width 2 1/8 in its length; sides somewhat flattened and slightly approximated above so cheeks with slight swollen appearance; profiles about evenly convex. Snout convex, width 1 1/3 its length. Eye elevated, near upper profile, hind pupil edge about midway in head length. Mouth rather broad, gape short, 3/5 to eye. Dental plates smooth, edges rather even, denticles strongly compressed, even and rounded; 2 small upper left posterior canines and 1 dextral. Lips narrow, only covering bases of dental plates. Front nostril very small, near last third of snout as seen in profile; hind nostril greatly larger or about 3/5 of pupil, rounded and near front nostril, though little elevated. Interorbital evenly convex.

Gill opening extends forward opposite front pupil edge. Gill rakers 20? + 35, slender, flexible, 1/4 of gill filaments or 1/3 of eye. Pseudobranchiae little shorter than gill filaments. Isthmus moderately wide.

Scales with 50 basal radiating striae, apical 80, with many auxiliaries incomplete and fine. Scales in even longitudinal rows. Cheek with 2 rows of scales, 5 scales in lower row. Single row of smaller scales crowded out along dorsal and anal bases and 3 moderately large caudal scales posteriorly. Scales on breast moderate. Axillary ventral scale not quite 1/3 of ventral fin. Tubes in lateral line slender, long, each with 3 or 4 rather long branches.

Dorsal spines flexible, fin origin little before that of pectoral; first dorsal spine 2 4/5 in head, last 3. Soft dorsal origin nearer caudal base than eye, rays more or less uniform; ninth 2 7/8. Anal inserted slightly behind soft dorsal origin, fin similar; third spine 3 1/4; eighth ray 3 1/3. Caudal concave behind, lower lobe little longer; expanded hind edge nearly straight, oblique; fin 1 1/5. Pectoral moderate, rather obtuse, 1 1/3. Ventral 2/3 to anal, fin 1 2/3 in head.

Largely dull brown. Narrow gray edges on dorsals and anals separated by submarginal brown line. Median portions of soft fins at least with dusky tint, though paler basally. Caudal dark brown, with many round pale brown spots. Pectoral rather dusky, hind edge narrowly pale to whitish. Head with yellowish blotches on side, yellow line to eye, 2 short postocular bars and 2 irregular yellow bars across mandible. Ventral pale, with deeper brown along front edge. Teeth greenish. Length 363 mm.

The Bishop Museum has one obtained by C. Montague Cooke, Jr., at Palmyra Island in 1913. The type of *Scarus brighami* is also in agreement in every way. It shows but a single upper posterior canine on the right side while 2 appear on the left. One from Wake Island in 1923. In the National Museum 4 specimens from Palmyra Island, the types of *Pseudoscarus jonesi*. Also type of *Callyodon latax* from Apia.

This species may be readily known by the large hind nostril and the broad pale band across the snout transversely.

Callyodon oktodon (Bleeker).

Pseudoscarus oktodon Bleeker: Akad. Wet. Amsterdam, Verslagen, vol. 12, p. 235, 1861 (type loc., Buton Island).

Pseudoscarus octodon Steindachner: Akad. Wiss. Wien, Denk., vol. 41, pt. 1, p. 19, 1879 (Society Islands).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 327, 1909 (Pelew Islands and Yap).

Head 2 4/5; depth 2 2/3; D. IX, 10, 1; A. III, 8, 1; scales 18 in upper section of lateral line, 5 in lower section to caudal base and 2 more on latter; 2 scales above, 6 below, 3 predorsal; snout 2 2/3 in head; eye 6 2/5; maxillary 5; interorbital 5.

Body oblong, ovate, deepest about middle of pectoral. Caudal peduncle well compressed, least depth 4/5 its length or 2 in head.

Head width 2 1/10 in its length. Snout convex, long as wide. Eye with hind edge midway in head length; diameter 2 2/5 in snout, 2 1/3 in interorbital. Mouth moderate, cleft half way to eye. Upper lip covers most of teeth. Each side posteriorly 2 canines above and 2 below. Front nostril at last third in snout; hind nostril at first third in space between front nostril and eye. Interorbital broadly convex. Gill rakers 12 + 27, fine, slender, 1/5 of gill filaments, which equal eye.

Scales with 42 to 50 basal radiating striae; apical 49 or 50; circuli very fine. Cheek with 2 rows of scales, of which 4 scales in lower row and none on preopercle flange. Dorsal spines pungent, first 2 4/5 in head; first dorsal ray 2 2/3; third anal spine 3 1/3; first anal ray 2 4/5; caudal 1 1/6, emarginate; pectoral 1 1/3; ventral 1 2/3.

Dull brown, with olivaceous tinge above, largely uniform. Iris pale brown. Dorsal and anal edges pale, latter little more broadly so forward. Pale line from mouth corner to lower front eye edge. Caudal brownish, with submarginal pale bordering crescent. Pectoral brown, lower edge paler. Ventral pale brownish. Length 258 mm.

In the Agassiz Museum 1 from Strong's Island, obtained by Rev. B. G. Snow. Also 8

from Society Islands, obtained by Andrew Garrett, largest 326 mm.

Zanzibar, East Indies, Micronesia, Polynesia.

Callyodon bataviensis (Bleeker).

Scarus bataviensis Bleeker: Nat. Tijds. Ned. Ind., vol. 13, p. 342, 1857 (type loc., Batavia, Java).

Pseudoscarus bataviensis Waite: Australian Mus., Mem., no. 3, p. 194, 1897 (Funafuti, Ellice Islands).—Seale: B. P. Bishop Mus., Occ. Papers., vol. 1, no. 3, p. 96, 1900 (Agaña, Guam).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 317, 1909 (Pelew Islands, Mortlock, Ponapé, Ruk, Yap, Marquesas, Tahiti, Samoa).

? Pseudoscarus filholi Sauvage: Soc. Philom. Paris, Bull., 7th ser., vol. 4, p. 225, 1879 (type loc., Fiji).

Callyodon cyanognathus (non Bleeker) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 60, 1906 (Faté, New Hebrides).

Head 3; depth 2 7/8; D. IX, 10, 1; A. III, 9, 1; scales 18 in upper section of lateral line, 5 in lower section, 2 on caudal base; 2 scales above lateral line, 6 below; 4 predorsal scales; snout 2 3/4 in head; eye 6 1/4; maxillary 4 2/3; interorbital 3 1/8. Least depth of caudal peduncle 2 in head. Head width 1 7/8 in its length. Posterior canines $\frac{1\text{-}2}{0\text{-}0}$.

Cheek with 2 rows of scales of which 6 in lower row. First dorsal spine 2 in head; ninth dorsal ray 3; third anal spine 3 1/10; eighth anal ray 2 4/5; caudal 1 1/10; pectoral 1 2/5; ventral 1 3/5.

In the Bishop Museum 1 from Agaña on Guam, 220 mm.; 1 from Faté with posterior canines $\frac{1\text{-}1}{1\text{-}1}$, 204 mm.; 1 from South Pacific, posterior canines $\frac{1\text{-}2}{2\text{-}2}$; 1 from Palmyra Island through C. Montague Cooke, Jr., in 1913, posterior canines $\frac{2\text{-}3}{2\text{-}2}$.

This species is distinguished by the green line extending from the rictus to the front edge of the eye, a green line on dorsals and anals medianly, besides 4 transverse blue lines on the caudal.

East Indies, Melanesia, Micronesia, and Polynesia.

Callyodon forsteri (Valenciennes).

Scarus forsteri Valenciennes: Hist nat. Poiss., vol. 14, p. 205, 1839 (type loc., Tahiti).

Pseudoscarus forsteri Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 318, pl. 145, 1909 (drawing of type).—Fowler: B. P. Bishop Mus., Bull. 22, p. 35, 1925 (Samoa).

Callyodon forsteri Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 410, 1928 (Pago Pago, Jaluit, Hawaii).

Pseudoscarus labiosus Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 591, 1882 (type loc., New Guinea).

Scarus viridis (non Bonnaterre) Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 527, 1900 (Samoa).

Scarus gilberti Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 59, fig. 17, 1899 (1900) (type loc., Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 21, 1902 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 471, 1902 (1903) (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, pt. 1, p. 76, 1922 (Hawaii).—Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., vol. 16, ser. 4, p. 667, 1927 (Hawaii).

Callyodon gilberti Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 354, fig. 154, 1903 (1905) (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 15, 1925 (Guam).

Scarus jenkinsi Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 195, 1902 (1903) (type loc., Honolulu).

Callyodon jenkinsi Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 353, 1903 (1905) (type).—Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 4, p. 33, fig. 7, 1905 (1906) (Honolulu).

Callyodon bataviensis (non Bleeker) Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 323, fig. 61, 1905 (1906) (Apia).

Scarus bataviensis Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 305, 1911 (Jaluit, Marshalls).

Dull olive-brown above. Lower and under surfaces of head and trunk whitish, with pale yellowish tint. Snout with purplish-gray tinge. Indistinct dark line from rictus to eye. Iris pale brown. Dorsals purplish-gray, spinous fin little darker forward and entire fin edge with submarginal dark line. Anals like dorsals, edges pale. Caudal lobes gray-brown, medianly fin with yellowish tinge and hind edge narrowly whitish. Pectoral yellowish-gray, with dusky spot at origin. Ventral yellowish-white. Length 310 mm.

One in the Bishop Museum from Honolulu. I found 5 in the Honolulu markets during December, 1922. The above noted specimen agrees in most respects with Jenkins' figure and description, but does not show the pale lines on the lips or across the mandible and the line from the streak from the rictus to the eye appears dark. One Hawaiian specimen in the National Museum and type of *Scarus jenkinsi*. Also 2 from New Guinea, larger 228 mm. The Wilkes Expedition obtained 1 from Tahiti and 1 Fiji. Also 1 from Pago Pago and 1 from Jaluit, Marshalls, as *Callyodon* and *Scarus bataviensis*. One from Guam in 1923. The Academy has 2 from Samoa, obtained by H. C. Caldwell, larger 258 mm. long, which I recorded as *Scarus viridus*. One in the Agassiz Museum from Jaluit.

Pseudoscarus labiosus Macleay is evidently synonymous. It has 2 rows of scales on the cheek and 2 canines at each mouth corner. Brownish-yellow, lighter below. Fins yellow, dorsal and anal with submarginal band. Two broad bands across chin. *Scarus* as described by Jouan from Port de France, Baie du Sud, New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 267, 1861) may be this species:

D. IX, 10; A. I, 10. Body elongate, depth 2 4/5. Snout conic. Eye small. Mouth small. Jaws bony. Large scales on head and cheek. Caudal crescentic. Reddish, with vertical clouded, blue bands. Longitudinal blue streaks on cheek and above mouth. Fins orange-yellow. Dorsal and anal bordered blue. Caudal bordered blue above and below. One variety blue, one green and one yellow. Length 300 mm.

East Indies, Micronesia, Polynesia, Hawaii.

Callyodon mutabilis Gray.

Callyodon mutabilis Gray: Cat. Fish. Gronow, p. 86, 1854 (type loc., Amboina).

Pseudoscarus mutabilis Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 316, 1909 (Samoa and Pelew Islands).

Pseudoscarus pentazona Schmeltz: Mus. Godeffroy, Cat. 6, p. 17, 1877 (Pelew Islands).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 36, 1878 (New Guinea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 276, 1883 (New Guinea).

Callyodon pentazonus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 60, 1906 (Shortland Island, Solomons).

Pseudoscarus schlegelii Schmeltz: Mus. Godeffroy, Cat. 6, p. 16, 1877 (Pelew Islands).

Scarus cypho Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 95, 1900 (type loc., Agaña, Guam).

Callyodon cypho Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 331, 1905 (1906) (type).

Callyodon cyanognathus (non Bleeker) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 60, 1906 (Shortland Island).

Head 3; depth 2 7/8; D. IX, 10, 1; A. III, 9; scales 17 in upper section of lateral line, 5 in lower section and 2 on caudal base; 2 scales above lateral line, 6 below; 4 predorsal scales; snout 2 3/5 in head; eye 6 3/4; maxillary 5 1/3; interorbital 3. Head width 2 in its length. Least depth of caudal peduncle 2 in head. Posterior canines $\frac{1-1}{0-0}$. Cheek with 2 rows of scales, lower row of 5 scales. First dorsal spine 2 1/4 in head; ninth dorsal ray 2 7/8; third anal spine 3 1/6; eighth anal ray 2 7/8; caudal lunate, 1 2/5; pectoral 1 2/5; ventral 1 7/8. Uniform brown. Teeth whitish. Caudal with dark submarginal line and transverse crescent of slightly deeper brown across at scale limitations. Dorsals with brown submarginal line and anal with similar line further removed from edge. Length 235 mm.

In the Bishop Museum the type of *Scarus cypho,* described above. Also a specimen 196 mm. from Shortland Island, with the posterior canines $\frac{1-1}{1-0}$, as *Callyodon cyanognathus.* Though it does not show all the color-patern of Bleeker's figure of *Pseudoscarus schlegeli,* such as remains is in agreement. It is similar in many respects to *Callyodon bataviensis,* but may readily be distinguished by the presence of scales in the lower cheek row.

East Indies, Melanesia, Micronesia, Polynesia.

Callyodon jordani (Jenkins).

Pseudoscarus jordani Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 63, fig. 21, 1899 (1900) (type loc., Honolulu).—Jenkins: op. cit., vol. 22, p. 471, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 358, fig. 157, 1903 (1905) (type; Apia).

Callyodon jordani Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 331, 1905 (1906) (Apia).

Pseudoscarus frontalis (non Valenciennes) Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 590, 1882 (type loc., New Guinea [as a new species]).

Callyodon macleayi Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 331, 1905 (1906) (on Macleay).

Head 2 2/3; depth 2 2/3; D. IX, 10, 1; A. III, 9, 1; scales 20, 4 in lateral line to caudal base and 2 more on latter; 2 scales above lateral line, 6 below, 6 predorsal; snout 2 1/5 in head; eye 10 1/5; maxillary 3 3/4; interorbital 2 2/3.

Least depth of caudal peduncle 2 1/2 in head; head width 2. Snout swollen convex, width at front of eyes 1 1/6 its length. Eye small, elevated. Canines $\frac{1-1}{0-0}$, projecting. Interorbital evenly convex. Gill rakers 22 + 32, slender, flexible, 1/6 of gill filaments or 1/3 of eye. Scales with 82 basal radiating striae and 11 auxiliaries, 76 apical with many fine auxiliaries; 3 rows of large cheek scales, only 1 scale comprising lower row on preopercle flange. Tubes in lateral line 4 to 6, fine, waved and twisted. First dorsal spine 2 1/2 in head; ninth dorsal ray 3 1/4; third anal spine 3 1/4; eighth anal ray 3 1/8; caudal 1 2/3, strongly emarginate, with long, slender, pointed ends which slightly over half of fin length; pectoral 1 1/2; ventral 1 2/3.

Largely faded dull brown. Iris dull slaty. Teeth greenish. Dorsals and anals with narrow pale margins. Pectoral brown, broadly pale on hind edge.

The Bishop Museum has 1 from Honolulu, 661 mm. long. In the National Museum, 1 skinned out 401 mm. long, obtained by the Wilkes Expedition at Bellinghausen Island.

Macleay's *Pscudoscarus frontalis* agrees closely with this species, except that he states there is but one scale on the preopercle flange, a variable character in most of the species of this genus.

Callyodon strongylocephalus (Bleeker).

Scarus strongylocephalus Bleeker: Nat. Tijds. Ned. Ind., vol. 7, p. 439, 1854 (type loc., Batavia, Java).

Pseudoscarus strongylocephalus Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 589, 1882 (New Guinea).

Callyodon strongylocephalus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 60, 1906 (Tahiti).

Scales in 3 rows on cheek, none on preopercle flange. Teeth greatly exposed, upper canine each side posteriorly. Caudal lobes exserted. Bluish-green, base of each scale with rosy spot. Blue line across front of snout, another across chin and each lip edged blue; blue line from behind rictus to eye and 3 blue bars from hind eye edge. Vertical fins rosy; dorsal and anal each with 4 longitudinal blue lines; caudal blue basally and bluish marginal crescent behind. Pectoral green above and below, rosy medially. Ventral rosy. Length 460 mm. (Bleeker).

I have not located in the Bishop Museum the 2 specimens Seale reported from Tahiti.

Callyodon microcheilos (Bleeker).

Pseudoscarus microchcilos Bleeker: Akad. Wet. Amsterdam, Verslagen, vol. 12, p. 231, 1861 (type loc., Java [Batavia]).

Pseudoscarus microchilus Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Samoa).

Cheek with 3 rows of scales, lower on preopercle limb; lips narrow, cover only bases of jaws; no canines; caudal emarginate. Lips red; body brown; dorsal and anal red with median row or band of green spots, one to each membrane. Length to 300 mm. (Bleeker).

East Indies.

Callyodon microrhinos (Bleeker).

Scarus microrhinos Bleeker: Nat. Tijds. Ned. Ind., vol. 6, p. 200, 1854 (type loc., Batavia, Java).

Pseudoscarus microrhinus Günther: Rept. voyage "Challenger," vol. 1, p. 36, 1880 (Kandavu, Fiji).—Macleay: Linn. Soc. New South Wales, Proc., vol. 9, p. 589, 1883 (New Guinea).—Günther: Mus. Godeffroy,

Jour., vol. 8, pt. 16, p. 322, pl. 156, 1909 (Ponapé, Ruk, Mortlock, Fiji, Society Islands, Samoa).

Callyodon microrhinus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 418 (type of *C. ultramarinus*).

Callyodon ultramarinus (Jordan and Seale) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 63, fig. 16, 1906 (head) (type loc., Mangareva, Gambier Islands; Apia, Samoa).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 332, fig. 64, 1905 (1906) (Apia and Pago Pago).

Forehead very convex, swollen. Green band from lower lip to rictus, then horizontally toward pectoral.

In the Bishop Museum head of a specimen from Mangareva. It has only an upper left canine projecting; snout 2 in head; eye 10 1/2; maxillary 4; interorbital 2 7/8. The crest on the forehead appears shrunken. In every way this agrees with Bleeker's figure of *Pseudoscarus microrhinos*. One in the National Museum from Samoa, type of *Callyodon ultramarinus*.

East Indies, China, Micronesia, Polynesia.

Callyodon harid (Forskål).

Scarus harid Forskål: Descriptiones animalium, pp. x, 30, 1775 (type loc., Arabia).

Pseudoscarus harid Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 306, 1909 (Pelew Islands, Ponapé, Ruk, Samoa).

Callyodon harid Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 420, 1928 (New Guinea).

Scarus longiceps Valenciennes: Hist. nat. Poiss., vol. 14, p. 179, 1839 (type loc., Waigiu).

Pseudoscarus longiceps Bleeker: Atlas. ichth., vol. 1, p. 50, 1862 (copied).—Guichenot: Soc. Hist. Nat. Cherbourg, Mem., vol. 11, p. 42, 1865 (type).

Two specimens in the National Museum from New Guinea, 135 and 190 mm. They somewhat suggest *Pseudoscarus mastax* Bleeker (Atlas ichth., vol. 1, p. 35, pl. 10, fig. 1, 1862), though the color is largely gone. They have 3 rows of scales on the cheek and the preopercle flange nude. The lateral line differs from any I have seen, in that both sections are parallel for at least 6 scales, so that the lower section begins about the middle of the body and is separated from the upper section by a single row of scales.

The description of *Scarus longiceps* suggests the present species, which is easily known by its long pointed head, and was based on a specimen 508 mm. long.

Red Sea, Mauritius, East Indies, Micronesia, Polynesia.

Callyodon pulchellus (Rüppell).

Scarus pulchellus Rüppell: Neue Wirbelth., Fische, p. 25, pl. 8, fig. 3, 1835 (type loc., Djedda, Red Sea).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 305, 1911 (Fakarava, Paumotus).

Pseudoscarus pulchellus Peters: Akad. Wiss. Berlin, Monatsb., p. 843, 1876 (1877) (New Britain).—Waite: Australian Mus., Mem., no. 3, p. 193, 1897 (Funafuti, Ellice Islands).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 305, 1909 (Pelew Islands and Ponapé).

Differs from *Callyodon harid* in the upper front profile convex; head and trunk above finely speckled or spotted with rosy or reddish. Reaches 500 mm.

One in the National Museum from Fakarava.

Red Sea, East Indies, Micronesia, Polynesia.

Callyodon cyanognathus (Bleeker).

Scarus cyanognathus Bleeker: Bataviaasch Genoot., Verh. (Labroid), vol. 22, p. 63, 1849 (type loc., Batavia, Java).

Callyodon cyanognathus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 60, 1906 (Shortland Island, Solomons; not Faté material).

Lips largely cover teeth; 4 scales in row on preopercle flange; caudal concave. Greenish; lips red; blue line from round upper lip to lower edge of eye; green median band on dorsals and anal; caudal with blue edges leaving median red crescent.

In the Bishop Museum 5 from Shortland Island, 174 to 238 mm. These have the posterior canines

1-2	2-0	0-0	0-1	1-1
—,	—,	—,	—,	—.
1-1	1-0	0-2	0-0	1-1

East Indies and Melanesia.

Callyodon dimidiatus (Bleeker).

Scarus dimidiatus Bleeker: Soc. Ind. Neerl., Act., no. 2, vol. 6, p (5) 17, 1859 (type loc., Doreh, New Guinea).—Bleeker: Nat. Tijds. Ned. Ind., vol. 20, p. 93, 1859-60 (New Guinea).

Pseudoscarus dimidiatus Bleeker: Atlas ichth., vol. 1, p. 41, pl. 16, fig. 1, 1862 (New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 17, 1877 (Pelew Islands).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 308, 1909 (Pelew Islands; Ponapé).

Callyodon dimidiatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 60, 1906 (Shortland Island, Solomon Islands).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 425, 1928.

Callyodon fumifrons Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 326, pl. 25, 1905 (1906) (type loc., Pago Pago).

Head 2 7/8; depth 2 3/5; D. IX, 10, 1; A. III, 10, 1; scales 17 in upper section of lateral line, 5 in lower section and 2 more on caudal base; 2 scales above lateral line, 6 below, 6 predorsal; snout 2 1/6 in head; eye 7 1/3; maxillary 3 7/8; interorbital 3. Least depth of caudal peduncle 2 1/10 in head; head width 2. No canines. Cheek with 3 rows of scales, lowest row of 3 scales on preopercle flange. First dorsal spine 2 2/3 in head; first dorsal ray 2 1/8; third anal spine 3 1/3; second anal ray 2 3/4; caudal 1 1/3; pectoral 1 1/4; ventral 1 7/8.

In the Bishop Museum 3 from Shortland Island 201 to 248 mm. The National Museum has 1 from Tongatabu obtained by the Wilkes Expedition and the type of *Callyodon fumifrons*.

Known by its coloration, the blackish preorbital and postorbital band curving towards the pectoral base, broadly edged yellow below, also front half of body and head green, hind half of body red.

East Indies, Melanesia, Micronesia, Polynesia.

Callyodon fasciatus (Valenciennes).

Scarus fasciatus Valenciennes: Hist. nat. Poiss., vol. 14, p. 164, 1839 (type loc., Moluccas).

Callyodon fasciatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 62, 1906 (Faté, New Hebrides).

Scarus mertensii Valenciennes: Hist. nat. Poiss., vol. 14, p. 209, 1839 (type loc., Uléa).

Pseudoscarus rivulatus (non Forskål) Steindachner:

Akad. Wiss. Wien, Denk., vol. 41, pt. 1, p. 19, 1879 (Society Islands).

Head 3; depth 2 3/4; D. IX, 10, 1; A. III, 9, 1; scales 17 in upper section of lateral line, 5 in lower section and 2 on caudal base; 2 scales above lateral line, 6 below; 7 predorsal scales; snout 2 1/8 in head; eye 8 1/2; maxillary 4 2/3; interorbital 2 3/4.

Least depth of caudal peduncle 2 1/6 in head. Head width 2 in its length. Snout convex in profile, width 1 1/6 in its length. Lips mostly conceal teeth. Canines $\frac{2\text{-}2}{0\text{-}1}$, concealed. Interorbital evenly convex. Gill rakers 17 + 22, slender, flexible, 4 1/2 in gill filaments, which 5 in head. Scales with 44 basal radiating striae, edge trilobate; apical striae 50. Cheek with 3 rows of scales, of which 2 scales in lowest row on preopercle flange. Most tubes in lateral line with 3 to 6 short branches. Dorsal and anal spines with terminal adipose pads; first dorsal spine 4 3/4 in head; first dorsal ray 3; third anal spine 3 3/5; first anal ray 3; caudal double concave, ends of lobes little exserted, fin 1 1/4; pectoral 1 1/2; ventral 2.

Largely uniform brownish. Edges of dorsals and anals pale. Hind pectoral edge pale.

One from Faté in the Bishop Museum. It agrees in general appearance with Bleeker's figure of *Pseudoscarus rivulatus* (Atlas ichth., vol. 1, pl. 9, fig. 3, 1862). Three specimens in the Agassiz Museum, from the Society Islands, obtained by Andrew Garrett, 291 to 328 mm.

Though described with some detail as to color *Scarus mertensii* appears to be a synonym, especially with the characteristic vermiculation of green on the side of the head.

India, East Indies, Melanesia, Polynesia.

Callyodon spinus (Kner).

Pseudoscarus spinus Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, pp. 31, 354, pl. 9, fig. 27, 1868 (type loc., Kandavu, Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Kandavu; Upolu).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 308, 1909 (Pelew Islands, Samoa, Tonga, Kanathia in Fiji).

Callyodon kelloggii Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 327, fig. 62, 1905 (1906) (type loc., Apia, Samoa).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 435, 1928 (type).

Whole front of head yellowish-green, cheeks and opercles yellow. Body blue. Vertical fins green; dorsal and anal each with longitudinal grayish band, more submarginal on former and median on latter; caudal with median grayish longitudinal band to each lobe. Pectoral greenish, ventral yellowish. Length 295 mm.

Type of *Callyodon kelloggii* in the National Museum.

Possibly the imperfectly described *Scarus frontalis* Valenciennes (Hist. nat. Poiss., vol. 14, p. 208, 1839, type loc., Oualan) may be this species: Front convex; caudal concave. Brilliant emerald-green, each scale of trunk with red-brown vertical streak; caudal and pectoral rays same tint with blue membranes; spots of blue on dorsal, not rays, also those of anal and ventral; space between upper lip and occiput pale sky-blue, medianly with large green blotch; eye small, with some orange on lids, also at rictus. Length 368 mm.

Callyodon frenatus (Lacépède).

Scarus frenatus Lacépède: Hist. nat. Poiss., vol. 4, p. 313, pl. 1, fig. 2, 1802 (type loc., "The Great Equinoxial Ocean" [Indo-Pacific]).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, pp. 3, 5, 1859 (Doreh, New Guinea).

Pseudoscarus frenatus Peters: Akad. Wiss. Berlin, Monatsb., p. 844, 1876 (1877) (New Britain).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 307, 1909 (Louisiades).

Callyodon frenatus Fowler: B. P. Bishop Mus., Bull. 22, p. 35, 1925 (Samoa).

Pseudoscarus viridis (non Bonnaterre) Günther: Cat. fishes Brit. Mus., vol. 4, p. 220, 1862 (Louisiades).

Basal half of the dorsals dark or dusky; buff band from snout to eye, then back towards pectoral origin. Lips largely cover teeth; canines present. Cheek scales in 3 rows, with lowest row of 1 or 2 scales on preopercle flange. Length 250 mm.

Mauritius, Seychelles, East Indies, Melanesia.

Callyodon janthochir (Bleeker).

Scarus janthochir Bleeker: Nat. Tijds. Ned. Ind., vol. 4, p. 139, 1853 (type loc., Ternate; Batavia).

Pseudoscarus altipinnis Steindachner: Akad. Wiss. Wien, Denk., vol. 41, pt. 1, p. 18, 1879 (type loc., Java; Celebes, Ternate, Kingsmills, Moluccas, New Ireland, Hawaiian islands).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 326, pl. 160, 1909 (Yap, Ponapé, Ruk, Hervey Islands, Paumotus).

Pseudoscarus godeffroyi Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 326, pl. 159, 1909 (type loc., Society Islands).

Head 3 1/8; depth 2 2/3; D. IX, 10, 1; A. III, 9, 1; scales 18 in upper section of lateral line, 5 in lower section to caudal base and 2 more on latter; 1 scale above, 6 below, 6 predorsal; snout 2 1/3 in head; eye 7; maxillary 5; interorbital 2 3/5.

Body oblong, ovate, well compressed. Caudal peduncle deep, well compressed, long as deep and least depth 1 9/10 in head.

Head width 2 1/8 in its length. Snout conic, long as wide. Eye with hind pupil edge midway in head length; diameter 3 in snout, 2 4/5 in interorbital. Mouth small, gape 2/5 to eye. Lips broad, half cover teeth. No canines. Front nostril at last third in snout; hind nostril little larger and close behind. Interorbital convex. Gill rakers 27+30, flexible, short, 5 1/2 in gill filaments or 2 1/4 in snout.

Scales with 40 basal radiating striae; apical 55; circuli fine. Cheek with 3 rows of scales, of which lowest of 2 scales on preopercle flange. Dorsal spines pungent, first 3 1/10 in head, ends adipose-like; first dorsal ray 2 1/8; third anal spine 2 4/5; first anal ray 2 1/4; caudal 1 1/8, convex behind, tips of upper and lower rays exserted points; pectoral 1 1/5; ventral 1 3/5.

Largely uniform dark brown. Pale line from lower front eye edge to chin and one around upper lip. Iris dull yellowish. Dorsals and anals deep warm dusky medianly, edges broadly paler; submarginally with narrow dark edge; traces of dark spots within dark area posteriorly. Caudal warm dusky, paler marginally. Pectoral deep brown, likewise most of front of ventral. Length 293 mm.

In the Agassiz Museum 2 from Apiang, Gilbert Islands, obtained by Andrew Garrett, larger 312 mm.

Pseudoscarus godeffroyi Günther is certainly *Callyodon janthochir*. Günther's figure differs a little from my specimen in the upper section of the lateral line not meeting the lower section. Bleeker gives 1 or 2 posterior canines for his

Scarus janthochir and though he figures the hind caudal nearly straight the pattern of coloration and characters otherwise greatly resemble *Pseudoscarus godeffroyi*. Likewise *Pseudoscarus altipinnis* Steindachner differs only in the variable color accounts of various authors.

Arabian Sea, East Indies, Melanesia, Micronesia, Polynesia and Hawaii.

Callyodon formosus (Valenciennes).

Scarus formosus Valenciennes: Hist. nat. Poiss., vol. 14, p. 210, 1839 (type loc., Hawaiian islands).—Eydoux and Souleyet: Voyage "Bonite," Zool., vol. 1, p. 191, pl. 6, fig. 3, 1841 (Hawaiian islands).

Pseudoscarus formosus Guichenot: Soc. Cherbourg, Mem., vol. 11, p. 57, 1865 (types).

Scarus xanthopleura Bleeker: Nat. Tijds. Ned. Ind., vol. 4, p. 499, 1853 (type loc., Batavia, Java).—Steindachner: Akad. Wiss. Wien, Denk., vol. 41, pt. 1, p. 19, 1879 (New Ireland and Society Islands).

Pseudoscarus xanthopleura Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 325, 1909 (Ponapé, Ruk, Mortlock, Society Islands).

Callyodon xanthopleura Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 384, 1923 (Honolulu).

Scarus lauia Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 196, 1902 (1903) (type loc., Hilo and Honolulu).

Callyodon lauia Jordan and Evermann: U. S. Fish Comm., vol. 23, pt. 1, p. 355, pl. 43, 1903 (1905) (Hilo and Honolulu).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1401, 1906 (Upolu).

Pseudoscarus lauia Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 4, p. 29, 1906 (Honolulu).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 310, 1909 (Hawaii).

Pseudoscarus heliotropinus Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, pt. 4, p. 23, fig. 3, 1905 (1906) (type loc., Honolulu).

Callyodon waitei Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 60, fig. 15, 1906 (type loc., Tahiti).

Head 2 4/5 to 3; depth 2 3/5 to 2 4/5; D. IX, 10, 1; A. III, 9, 1 or 8, 1; scales 17 to 19 in upper section of lateral line, 4 or 5 in lower section and 2 on caudal base; 2 scales above lateral line, 6 or 7 below; 4 to 6 predorsal scales; snout 2 1/8 to 2 4/5 in head; eye 7 1/6 to 10; maxillary 3 7/8 to 5 2/5; interorbital 2 4/5 to 2 5/6.

Least depth of caudal peduncle 2 1/8 to 2 4/5 in head. Head width 1 7/8 to 2 in its length. Lips cover half to 2/3 of teeth. Posterior canines

2-2	1-0	1-1	1-1	1-1
—,	—,	—,	—,	—,
0-0	0-0	1-0	1-1	0-0

sometimes absent. Cheek with 3 rows of scales, 2 scales in lowest row on preopercle flange. First dorsal spine 2 3/4 to 2 4/5 in head; first dorsal ray 1 3/4 to 2 1/2; eighth dorsal ray 2 1/3 to 2 4/5; third anal spine 2 1/3 to 3 2/3; eighth anal ray 2 1/2 to 2 3/5; caudal to end of median rays 1 2/3; pectoral 1 1/4 to 1 1/2; ventral 1 3/5 to 1 3/4.

Nearly uniform brown. Green line on edge of each lip, then from rictus to eye. Green line across chin. Two green blotches on lower surface of head each side. Short green line from nostril to eye. Two short green lines from hind eye edge. Dorsals with narrow yellow edge, medium yellow band and basal yellow band whole length of both fins, rest of fin greenish. Basal half of anal yellowish, outer half greenish, median edge of division quite dark. Dark basal green line along anal base. Caudal with each lobe to ends of produced points pale brown, edged narrowly with greenish, with pale brown broad transverse band across middle of fin, also edged with dark green; hind caudal edge very pale yellowish. Pectoral with pale marginal band above, edge very narrowly dusky. Ventral pale. Teeth greenish.

In the Bishop Museum 12 from Honolulu, 207 to 360 mm. Also the type of *Callyodon waitei*, 508 mm. These have posterior canines

1-2	2-2	1-1	2-1	0-2,	2-2	2-2	2-2
—.	—,	—,	—,	—,	—,	—.	—;
0-0	1-2	0-0	1-1	1-2	1-1	1-1	1-2

lips cover jaws; caudal lobes variable, exserted in adult, sometimes upper or lower variously longer. In the National Museum 1 Hawaiian specimen and type of *Scarus lauia*.

These specimens all agree in the fundamental features of Bleeker's *Pseudoscarus xanthopleura*. Compared with his figure they agree in the presence of 3 rows of scales on the cheek and with 2 scales on the preopercle flange, line from nostrils to eye, line across chin, band along upper pectoral edge and pale (red) band on each caudal lobe and transversely across middle of caudal. While my specimens show a yellow line from the rictus to the eye, Bleeker's figure shows a broken rictal bar to the lower edge of the eye. The bands on the dorsals and anals are different, though like those on the head within the limits of the fundamental color-pattern.

East Indies, Melanesia, Micronesia, Polynesia, Hawaii.

Callyodon caudofasciatus (Günther).

Pseudoscarus caudofasciatus Günther: Cat. fishes Brit. Mus., vol. 4, p. 283, 1862 (type loc., Mauritius).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 312, pl. 153, figs. A-B, 1909 (Ponapé, Mortlock, Samoa).

Callyodon caudofasciatus Fowler: B. P. Bishop Mus., Bull. 22, p. 35, 1925 (Samoa).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 449, 1928 (type of *C. zonularis*).

Callyodon pentazonus (non Bleeker) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 60, 1906 (Shortland Island).

Callyodon zonularis Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 321, fig. 60, 1905 (1906) (type loc., Pago Pago).

Head 2 7/8 to 3; depth 2 7/8 to 3; D. IX, 10, 1; A. III, 9, 1; scales 18 or 19 in upper section of lateral line, 4 or 5 in lower section and 2 on caudal base; 2 scales above lateral line, 6 below; 6 or 7 predorsal scales; snout 2 1/3 in head; eye 6 1/2; maxillary 4 1/5; interorbital 2 3/4.

Head width 2 1/10 to 2 1/6 in its length. Snout convex, width 1 1/5 in its length. No posterior canines. Interorbital broadly convex. Gill rakers 13 + 30, short, slender, flexible, 3 1/2 in gill filaments, which 6 2/3 in head. Scales with 23 to 28 basal radiating striae, apical 26 to 36. Cheek with 3 rows of scales, lowest on preopercular flange and with 3 or 4 scales. Tubes in lateral line slender, each with 1 to 3 short branchlets. Caudal truncate, slightly convex behind when expanded.

Body pale brownish. Five deep brown saddle-like blotches, inclined little forward obliquely on back, reflected upon dorsal fin bases. Fins otherwise all pale brownish. Length 212 mm.

One in the Academy from Pago Pago. In the Bishop Museum 2 from Shortland Island 189

and 193 mm. long. Types of *Callyodon zonularis*, 2 specimens in the National Museum from Pago Pago.

East Africa, Mauritius, East Indies, Micronesia, Polynesia.

Callyodon garretti (Günther).

Pseudoscarus garretti Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 306, pl. 153, fig. C, 1909 (type loc., Kingsmill Islands).

Cheek with 3 rows of scales of which lowest row of 2 scales on preopercle flange. No hind canines. Caudal little emarginate. Gray-brown, with 5 diffuse steel-blue crossbands, less in width than interspaces. Blue band over upper and lower lip and from mouth corner to eye; 2 above and 2 behind eye. Dorsal and anal each with blue basal band, one median longitudinal on dorsals and another submarginal on anal. Caudal edged above and below blue. Length 305 mm. (Günther)

Callyodon dussumieri (Valenciennes).

Scarus dussumieri Valenciennes: Hist. nat. Poiss., vol. 14, p. 187, 1839 (type loc., Seychelles).

Pseudoscarus dussumieri Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 309, 1909 (Ponapé; Faté).

Callyodon dussumieri Fowler: B. P. Bishop Mus., Bull. 38, p. 26, 1927 (Christmas and Fanning islands).

Cheek with 3 rows of scales, of which 2 scales on preopercle flange. Lips largely cover teeth. Upper hind canines 1 or 2. Green; green band between eyes and 2 from mouth to eye; vertical fins edged blue, without median band. Length 402 mm. (Bleeker)

Red Sea, East Africa, East Indies, Melanesia, Micronesia.

Callyodon rostratus (Günther).

Pseudoscarus rostratus Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 315, pl. 154, 1909 (type loc., Society Islands).

Cheek with 3 rows of scales, of which lowest row on preopercle flange of 2 scales. Teeth white, with upper canines. Caudal lobes exserted points. Back greenish, below white, each scale with narrow reddish edge. Lips edged blue and 2 blue bands across chin. Dorsal and anal red with edges and bases blue. Caudal green, each lobe with median or submarginal violet band longitudinally. Length 458 mm. (Günther)

Known from Garrett's figure as reproduced by Günther. Perhaps not distinct from *Callyodon dussumieri*.

Callyodon lepidus (Jenyns).

Scarus lepidus Jenyns: Voyage "Beagle," Fishes, p. 106, 1842 (type loc., Tahiti).

Pseudoscarus lepidus Günther: Cat. fishes Brit. Mus., vol. 4, p. 224, 1862 (type).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 310, 1909 (type).

Callyodon lepidus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 60, 1906 (Rarotonga, Cook Islands).

Head 3 1/3; depth 3; D. IX, 10, 1; A. III, 9, 1; scales 20 in upper section of lateral line, 5 in lower section and 2 on caudal base; 2 scales above lateral line, 7 below; 6 predorsal scales; snout 2 1/2 in head; eye 7 3/4; maxillary 6; interorbital 2 2/3.

Least depth of caudal peduncle 2 in its length. Head width 1 7/8 in its length. Snout convex, long as wide. Lower hind canine concealed each side, none above. Lips cover teeth entirely. Interorbital evenly convex. Gill rakers 10 + 25, fine, slender, flexible, 1/5 of gill filaments, which 4 4/5 in head. Scales with 31 basal radiating striae; apical 45. Cheek with 3 rows of scales, of which 3 comprising lowest row on preopercle flange. Last scale of upper section of lateral line next to first one in lower straight section. First dorsal spine 2 3/4 in head; first dorsal ray 2 3/4; third anal spine 3 3/4; first anal ray 2 3/4; caudal double concave behind, fin 1 2/5; pectoral 1 1/4; ventral 1 3/4. Dorsal and anal spines rather flexible terminally and with slight adipose-pads.

Color dark brown generally. Caudal base yellowish. Length 253 mm.

One in the Bishop Museum from Rarotonga. It agrees with Günther's account of the type.

Callyodon oviceps (Valenciennes).

Scarus oviceps Valenciennes: Hist. nat. Poiss., vol. 14, p. 181, 1839 (type loc., Tahiti).

Pseudoscarus oviceps Guichenot: Soc. Cherbourg, Mem., vol. 11, p. 43, 1865 (type).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 17, 1877 (Pelew Islands).—Steindachner: Akad. Wiss. Wien, Denk., vol. 41, pt. 1, p. 19, 1879 (Society Islands).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 312, pl. 152, fig. A, 1909 (Pelew Islands, Kingsmills, Samoa, Society Islands, Paumotus).

Callyodon oviceps Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 63, 1906 (Tahiti).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 321, 1905 (1906) (Pago Pago and Apia).—Fowler: B. P. Bishop Mus., Bull. 22, p. 35, 1925 (Samoa).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 452, 1928 (Apia).

Pseudoscarus zonatus Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 591, 1883 (type loc., New Guinea).

Scarus lupus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 49, pl. 18, fig. 1, 1899 (type loc., Thornton Island).

Callyodon dubius (non Bennett) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 59, 1906 (Tubuai, Austral Islands).

Head 2 7/8 to 3; depth 2 7/8 to 3; D. IX, 10, 1; A. III, 9, 1; scales 19 in upper section of lateral line, 5 in lower section to caudal base and 2 more on latter; 2 scales above lateral line, 6 below, 7 predorsal; snout 2 1/10 to 2 1/6 in head; eye 6 1/2 to 7 1/2; maxillary 3 2/3 to 4; interorbital 2 3/4 to 2 7/8.

Least depth of caudal peduncle 2 1/4 in head; head width 2 to 2 1/8. Snout convex, little swollen convexly forward, width 1 1/5 its length. Lips nearly cover teeth. No canines. Interorbital evenly convex. Gill rakers 15 + 28, short, slender, flexible, 1/4 of gill filaments, which 5 1/2 in head. Scales with 19 to 26 basal radiating striae, apical 26 to 28. Tubes in lateral line largely simple or with 1 or 2 very small, short branches. Cheek scales in 3 rows, lowest smallest and covers preopercle flange. First dorsal spine 3 1/3 in head, ninth 3 2/3; ninth dorsal ray 3; third anal spine 2 1/2; eighth anal ray 3 1/6; caudal 1 1/3; pectoral 1 2/5; ventral 1 4/5.

Back and upper surface fuscous, below pale brownish. Pale oblique bar, color of belly, on side up from just before pectoral end to last dorsal spines. On head dusky streak divides color above from that of cheek and below, extending horizontally from side of snout to lower eye edge, then to opercle angle. Dorsals pale brown, edge of spinous fin gray-brown. Other fins all pale brown, uppermost pectoral rays brownish.

In the Academy 1 from Apia 197 mm. and the type of *Scarus lupus* from Thornton Island, 290 mm., a dry skin. The Bishop Museum has a single specimen from Tahiti, 294 mm. The National Museum has 2 from Samoa, 88 and 142 mm. long, obtained by the Wilkes Expedition. Also 5 from Apia through the Bureau of Fisheries. In the Agassiz Museum 5 from the

Society Islands, obtained by Andrew Garrett, the largest 305 mm.

Gunther's figure of this species shows but 2 anal spines. *Pseudoscarus zonatus* Macleay is clearly a synonym.

East Indies, Micronesia, Polynesia.

Callyodon pectoralis (Valenciennes).

Scarus pectoralis Valenciennes: Hist. nat. Poiss., vol. 14, p. 200, 1839 (type loc., Djedda, Red Sea).

Pseudoscarus pectoralis Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 324, pl. 158, 1909 (Pelew and Society Islands).

Callyodon pectoralis Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 25, 1925 (Wake Island).—Fowler: op. cit., Bull. 38, p. 26, 1927 (Fanning and Jarvis islands).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 453, 1928 (type of *C. lazulinus*).

Callyodon lazulinus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 333, fig. 65, 1905 (1906) (type loc., Apia and Pago Pago, Samoa).

Canines present. Cheek with 3 rows of scales, of which lowest row 3 scales on preopercle flange. Top of head and predorsal dark brown; broad yellow band across upper lip to lower eye edge; anal yellow, outer portion broadly greenish; pectoral pale, with broad dark longitudinal band. Length 329 mm.

Type of *Callyodon lazulinus* from Samoa, in the National Museum, examined.

Red Sea, East Africa, Philippines, Micronesia and Polynesia.

Callyodon balinensis (Bleeker).

Scarus balinensis Bleeker: Batav. Genoot., Verh. (Bali), vol. 22, p. 8, 1849 (type loc., Bali).

? Pseudoscarus moresbyensis Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 590, 1882 (type loc., New Guinea).

Callyodon tricolor (non Bleeker) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 60, 1906 (Shortland Island).

Callyodon bataviensis (non Bleeker) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 60, 1906 (Faté, New Hebrides).

Callyodon moensi (non Bleeker) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 63, 1906 (Faté, New Hebrides).

Head 3 to 3 1/6; depth 2 2/3 to 2 3/4; D. IX, 10, 1; A. III, 9, 1; scales 18 or 19 in upper section of lateral line, 5 in lower section to caudal base and 2 more on latter; 2 scales above, 6 below, 7 predorsal; snout 2 1/5 in head; eye 6 4/5 to 7; mouth cleft 4 or 5; interorbital 2 7/8 to 3 1/8.

Body oblong, ovate, well compressed. Caudal peduncle strongly compressed, length equals least depth, which 2 1/3 to 2 2/5 in head.

Head width 2 1/6 to 2 1/5 in its length. Snout convex, then slightly concave in profile, width 1 1/5 in its length. Eye midway in head length; diameter 3 in snout, 2 1/8 in interorbital. Mouth moderate, gape half way to eye. Lips largely cover teeth. Pair of hind canines each side above, none below. Nostrils small, close together, front one at last third in snout length. Interorbital convex. Gill rakers 18 + 26, fine, flexible. 3 3/5 in gill filaments, which 2 1/2 in snout.

Scales with 29 basal radiating striae; apical 48; circuli very fine. Scales on cheek with 3 rows, lowest row on preopercle flange as 2 scales separated by interval of scale above. Tubes in lateral line slender and with but few branchlets, or 2 or 3. First dorsal spine 3 1/10 in head; first ray 2 3/5 to 2 7/8; second anal spine 3 2/3; first ray 3 1/4; caudal 1 1/4 to 1 1/2, emarginate behind; pectoral 1 2/5; ventral 1 7/8.

Largely uniform brownish. Fins all more or less dark, with tinge of greenish. No trace of dark edges to fins. Length 298 mm.

In the Agassiz Museum 1 from Society Islands, obtained by Andrew Garrett. In the Bishop Museum 1 from Faté, 217 mm. long as *Callyodon moensi*. Caudal slightly emarginate and scales on preopercle flange 2 and close together. The larger specimen, as *Callyodon bataviensis* noted above, same locality, is 258 mm. It has 2 scales on the preopercle flange, but separated by a scale width, whereas in the others they are close together. Also a small specimen from Faté, 67 mm. All without posterior canines. Also 6 from Shortland Island in the Bishop Museum as *Callyodon tricolor*, 167 to 188 mm. These agree in most every way with Bleeker's figure of *Pseudoscarus balinensis* (Atlas ichth., vol. 1, pl. 16, fig. 3, 1862) except that the dorsals, anals and caudal, also pectoral, show no traces of blue edges. They cannot possibly be *Pseudoscarus tricolor* of Bleeker, as that species is shown with 3 scales in the lower cheek row on the preopercle flange. None have posterior canines and lowest row of cheek scales on the preopercle flange consists of 2 scales in every case.

Pseudoscarus moresbyensis Macleay is very briefly described and may be *Callyodon balinensis:*

Cheek with 3 rows of scales, median row of 5 and lowest row of 2 on preopercle flange. Tail truncate. Whitish jaws half covered by lips. Body green and magenta, top of head brownish, rest green, tail green and magenta with sea-green edges, orbit light hazel.

East Indies, Melanesia.

Callyodon tricolor (Bleeker).

Scarus tricolor Bleeker: Bataviaasch Genoot., Verh. (Labroid.), vol. 22, p. 59, 1849 (type loc., Batavia, Java).

Callyodon tricolor Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 26, 1925 (Wake Island).

Head 2 4/5 to 3; depth 2 3/4 to 3; D. IX, 10, 1; A. II, 9, 1 or 10; scales 19 in upper section of lateral line, 4 or 5 in lower section to caudal base and 2 more on latter; 2 scales above lateral line, 6 below; 7 predorsal scales; snout 2 1/4 to 2 2/5 in head; eye 6 to 6 1/4; maxillary 4 1/8 to 4 1/3; interorbital 2 4/5 to 2 7/8.

Body well compressed, contour elongate-ovoid. Caudal peduncle well compressed, length 7/8 its least depth, which 2 1/4 to 2 1/3 in head.

Head width 2 to 2 1/6 in its length. Snout convex over surface and in profile, about long as wide. Eye but little elevated, hind pupil edge midway in head; diameter 3 in snout, 2 4/5 in interorbital. Mouth moderate, little inclined forward. Lips broad, cover most of teeth. Single upper canine each side posteriorly. Nostrils small, together, within last fourth of snout. Interorbital convexly elevated. Gill rakers 70, flexible, slender points, 3 1/4 in gill filaments, which slightly greater than eye. Cheek with 3 rows of scales and lowest row of 3 scales on preopercle flange. Scales with 25 to 31 basal radiating striae, 22 to 36 apical radiating; circuli very fine. Third dorsal spine 2 1/3 to 2 2/3 in head; first dorsal ray 2 1/2 to 2 3/5; second anal spine 3; third anal ray 2 3/4 to 2 4/5; caudal 1 to 1 1/5, deeply emarginate, hind edge truncate with

exserted tips; pectoral 1 1/6 to 1 1/3; ventral 1 3/5.

In alcohol deep drab-gray to heliotrope-purple generally. Whole side of trunk medianly deep campanula-blue. Lips broadly buff. Dusky-blue shade from below eye back across side of head towards pectoral base. Iris brown. Dorsals dark drab-gray, edge of spinous fin dusky. Caudal and anal pale yellowish, though upper and lower rays of former brownish. Paired fins yellowish, former with neutral-gray at base above. Length 320 to 376 mm.

Two in the Bishop Museum from Wake Island in 1923.

Callyodon blochii (Valenciennes) (fig. 60).

Scarus blochii Valenciennes: Hist. nat. Poiss., vol. 14, p. 162, 1839 (type loc., Java).

Scarus quoyi (part) Valenciennes: Hist. nat. Poiss., vol. 14, p. 203, 1839 (New Ireland).

Pseudoscarus viridus (non Bonnaterre 1788) Schmeltz: Mus. Godeffroy, Cat. 5, p. 34, 1874 (Savay).—Peters: Akad. Wiss. Berlin, Monatsb., p. 843, 1876 (1877) (New Hannover).

Pseudoscarus chrysopoma Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 589, 1882 (New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 307, 1909 (Pelew Islands, Ponapé).

Callyodon papuensis Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 590, 1888 (type loc., New Guinea).

Callyodon pyrrhostethus (non Richardson) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 60, 1906 (Faté, New Hebrides).

Callyodon balinensis (non Bleeker) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 60, 1906 (Tahiti).

Brown, lighter on lower surface and sides of head and under surface of trunk. Pale band transversely across internasal space and wider one across interorbital. Below eye all of head pale. Dorsals with marginal and basal greenish bands and on soft dorsal median greenish band, mostly broken as blotches. Caudal margined green and basally band of green less distinct. Pectoral with dusky spot at origin and broad dusky band longitudinally above.

The Bishop Museum has 1 from Faté, 218 mm., and 1 from Tahiti 214 mm., latter with teeth $\frac{1-1}{2-2}$. The canines are strongly developed.

Bourbon, Reunion, East Indies, Melanesia, Polynesia and Micronesia.

Callyodon rubroviolaceus (Bleeker).

Scarus rubroviolaceus Bleeker: Bataviaasch Genoot., Verh. (Labroid.), vol. 22, p. 52, 1849 (type loc., Batavia, Java).

Pseudoscarus rubroviolaceus Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Samoa).—Steindachner: Akad. Wiss. Wien, Denk., vol. 41, p. 19, 1879 (Kingsmills and Society Islands).

Callyodon rubroviolaceus Fowler and Silvester: Carnegie Inst., Marine Pap., p. 122, 1922 (Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 16, 30 (Guam; Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 25, 1925 (Wake Island).——Fowler: op. cit., Bull. 38, p. 26, 1927 (Jarvis Island).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 469, 1928 (type of *C. ruberrimus* and *C. upolensis*, Honolulu).

Scarus paluca Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 60, fig. 18, 1899 (1900) (type loc., Honolulu).—Jenkins: op. cit., vol. 22, p. 471, 1902 (1903) (type).—Snyder: op. cit., p. 531, 1902 (1904) (Honolulu).

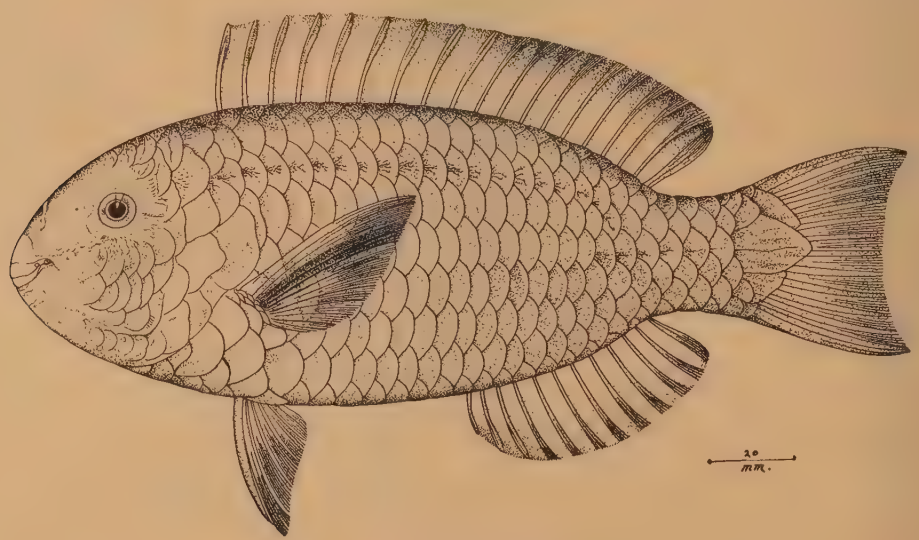

FIGURE 60.—Drawing of *Callyodon blochii*.

Head 3; depth 2 4/5; D. IX, 10, 1; A. III, 9 1; scales 19 in upper section of lateral line, 5 in lower section and 2 on caudal base; 2 scales above lateral line, 6 below; 7 predorsal scales; snout 2 2/5 in head; eye 6; maxillary 5; interorbital 2 3/5. Least depth of caudal peduncle 2 1/10 in head. Head width 2 in its length. Posterior canines $\frac{2-2}{1-1}$. Scales in 3 rows on cheek, lowest row as 2 scales on preopercle flange. First dorsal spine 3 1/4 in head; ninth dorsal ray 2 7/8; third anal spine 2 4/5; eighth anal ray 3 1/8; caudal 1 1/3; pectoral 1 1/3; ventral 1 7/8.

Callyodon lacerta (non Valenciennes) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 60, 1906 (Shortland Island, Solomons).

Callyodon ruberrimus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 316, fig. 56, 1905 (1906) (type loc., Pago Pago, Samoa).

Pseudoscarus ruberrimus Günther: Mus. Godeffroy,

Jour., vol. 8, pt. 16, p. 314, 1909 (Hawaii, Samoa, Ruk, Pelew Islands).

Callyodon upolensis Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 319, fig. 59, 1905 (1906) (type loc., Apia).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 614, 1908 (Suva, Fiji).

Head 3 to 3 1/4; depth 2 7/8 to 3 1/4; D. IX, 10, 1; A. III, 8, 1 or III, 9, 1; scales 19 in upper section of lateral line, 4 or 5 in lower section and 2 on caudal base; 2 scales above lateral line, 6 below; 6 predorsal scales; snout 2 1/2 in head; eye 5 7/8 to 7; maxillary 4 1/4 to 4 1/3; interorbital 2 7/8 to 3.

Body elongately ovoid, well compressed. Least depth of caudal peduncle 2 1/10 to 2 1/4 in head length. Head width 2 in its length. Snout convex, profile swollen or sometimes with depression above nostrils; width 1 1/8 to 1 1/6 in its length. Eye center about midway in head length, hind pupil edge midway in large example. Lips cover basal half to most of teeth. No posterior canines. Nostrils small, close together, alike. Interorbital evenly convex. Gill rakers 17+28, flexible, slender, 5 1/2 in gill filaments, which 5 1/2 in head. Scales with 21 to 30 basal radiating striae; 34 or 35 apical parallel striae. Cheek with 3 rows of scales, lowest of row of 2 or 3 scales on preopercle flange. First dorsal spine 3 1/3 in head; last spine 2 3/4; first dorsal ray 2 2/3; ninth dorsal ray 3 1/6; third anal spine 2 2/5; first anal ray 2 1/5; eighth anal ray 3 1/3; caudal moderately emarginate (truncate in young), hind edge slightly double-concave when expanded, with short upper and lower points, length 1 1/3 to 1 2/5 in head; pectoral 1 1/3 to 1 3/5; ventral 1 2/3 to 2.

Dark sienna to dusky-brown, without lines or bands. Sometimes obscure darker mottling on upper surface and back. Fins all with more or less dusky, lower hind pectoral edge little pale. Iris slaty. Teeth whitish.

The Bishop Museum has 3 from Shortland Island, 1 Tubuai, 1 Tahiti, 1 Makatea, and 1 Raiatea. Largest 304 mm. Two from Wake Island and 2 from Guam in 1923. In the National Museum the types of *Scarus paluca*, *Callyodon ruberrimus* and *Callyodon upolensis*. The Agassiz Museum has 3 from the Kingsmill Islands and 4 from the Society Islands, obtained by Andrew Garrett. In the Academy 3 young from Pago Pago.

According to Bleeker "L'espèce actuelle varie assez notablement par les couleurs. Ces variations ne dependent pas uniquement de l'âge ou du sexe, et sont en général très-peu constantes. Souvent les taches noirâtres des ecailles du flanc sont alongées, formant des bandes longitudinales jumelles plus ou moins continues, et souvent aussi ou u'en observe rien." Günther says of the scales on the preopercle flange "aus drei bis vier Schuppen besteht."

Zanzibar, Arabia, East Indies, Melanesia, Micronesia, Polynesia and Hawaii.

Callyodon macrocheilos (Bleeker).

Scarus macrocheilos Bleeker: Nat. Tijds. Ned. Ind., vol. 6, p. 60, 1854 (type loc., Singangole, Halmaheira).

Callyodon macrocheilus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 60, 1906 (Faté, New Hebrides).

Cheek with 3 rows of scales, lowest row of 4 scales on preopercle flange. No canines. Largely yellow, head, back and spinous dorsal violaceous. Lower surface of head, breast and pectoral greenish. Ventral pinkish. Length 111 mm. (Bleeker)

Included on Seale's reference to 2 specimens from Faté. These I did not locate in the Bishop Museum.

East Indies.

Callyodon dubius (Bennett).

Scarus dubius Bennett: Zool. Journ., vol. 4, p. 37, 1828 (type loc., Hawaiian islands).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, pl. 44, 1903 (1905).—Fowler: B. P. Bishop Mus., Bull. 38, p. 26, 1927 (Christmas Island).

Pseudoscarus dubius Günther: Cat. fishes Brit. Mus., vol. 4, p. 229, 1862 (type; Fiji).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 313, 1909 (type; Tahiti; Raiatea; Samoa; Marquesas; Fiji).

Callyodon dubius Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 350, 1903 (1905) (Honolulu).—Fowler: Copeia, no. 112, p. 83, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 30, 35, 1905 (Honolulu; Samoa).—Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 473 (Apra Bay on Guam, Fanning, Honolulu, Apia).

Scarus bennetti Valenciennes: Hist. nat. Poiss., vol. 14, p. 201, 1839 (type loc., Hawaiian islands).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 470, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, pl. 45, 1903 (1905).

Callyodon bennetti Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 352, 1903 (1905) (Honolulu; Samoa).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 315, 1905 (1906) (Apia).

Callyodon bennettii Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1400, 1906 (Upolu).

Pseudoscarus aeruginosus Kner: Reise "Novara" Fische, vol. 2, p. 261, 1865 (Tahiti).[—Bleeker: Atlas Ichth. Ind. Neerl., vol. 1, p. 40, pl. 17, fig. 2, 1862 (East Indies).]—Schmeltz: Mus. Godeffroy, Cat. 5, p. 34, 1874 (Samoa; Tonga).—Streets: U. S. Nat. Mus., Bull., no. 7, p. 81, 1877 (Fanning Islands).—Steindachner: Akad. Wiss. Wien, Denk., vol. 41, pt. 1, p. 19, 1879 (Society and Kingsmill Islands).

Scarus oviceps (non Valenciennes) Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 512, 1900 (Hawaii).

Callyodon balinensis (non Bleeker) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 60, 1906 (Shortland Island, Solomons; not Tahiti specimen).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 320, 1905 (1906) (Apia).

Callyodon erythrodon (non Valenciennes) Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 317, 1905 (1906) (Pago Pago).

Callyodon lacerta Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 319, 1905 (1906) (Pago Pago, Apia).

Head 2 1/2 to 3; depth 2 3/5 to 3 1/4; D. IX, 10, 1; A. III, 9, 1; scales 17 to 19 in upper section of lateral line, 4 or 5 in lower section and 2 more on caudal base; 2 scales above lateral line, 6 or 7 below, 4 to 7 predorsal; snout 2 1/4 to 3 1/3 in head; eye 4 to 7; mouth cleft 3 7/8 to 5 3/4; interorbital 2 3/4 to 4.

Body oblong, ovate, well compressed. Caudal peduncle strongly compressed, long as deep or least depth 2 2/5 to 2 3/5 in head. Head width 2 to 2 1/3 in its length. Snout width 1 to 1 1/2 its length. Eye with front pupil edge midway in head length, diameter 2 1/4 to 3 in snout, 2 in interorbital. Mouth moderate, cleft 2/5 to 1/2 to eye. Lips cover teeth. No canines, seldom even rudiment. Nostrils small, close together, front one at last 1/4 in snout, hind one close behind front one. Interorbital convex. Gill

rakers 18 or 19 + 21 to 30, fine, flexible, 4 to 4 1/2 in gill filaments, 2 2/3 to 3 in snout. Scales with 21 to 37 basal radiating striae, 36 to 47 apical; circuli very fine; cheek with 3 rows of scales, lowest row of 1 to 3 scales on preopercular flange. Tubes in lateral line slender, with 2 to 4 slender contracted branchlets. First dorsal spine 2 1/2 to 2 4/5 in head; first dorsal ray 2 2/5 to 2 1/2; third anal spine 3 to 3 1/4; first anal ray 2 3/5 to 3 1/4; caudal 1 2/5, slightly concave, corners pointed, truncate in young and convexly rounded as expanded; pectoral 1 1/3 to 1 3/5; ventral 1 2/3 to 1 9/10.

Bistre to warm sepia above. Along each side of abdomen 3 pale longitudinal streaks or bands, traversing each row of scales medially. Dorsals, anals and caudal like back. Pectoral pale bistre, with paler band broadly along hind edge. Ventral brownish, variably pale. Length 50 to 323 mm.

In the Agassiz Museum 1 from the Society Islands through Andrew Garrett. Larger of these with canines $\frac{1\text{-}2}{0\text{-}0}$. Also 1 Hawaiian example and 1 from the Kingsmills, both through Andrew Garrett. The Academy has a Hawaiian specimen I wrongly determined as *Scarus oviceps* through J. K. Townsend and 2 from Pago Pago. The National Museum has 4 from New Guinea, 1 from Tahiti through William Stimpson, 3 from the Fanning Islands through T. H. Streets, 1 from Honolulu, 1 from Apia, 1 from Apia as *Callyodon balinensis,* 15 from Samoa as *Callyodon lacerta,* 3 from Samoa as *Callyodon erythrodon.*

An extremely variable species, with lips covering the teeth in most specimens; canines absent, with 3 rows of scales on the cheek or those on preopercle flange seldom absent and usually 3 whitish longitudinal streaks.

Mauritius, East Indies, China, Melanesia, Micronesia, Polynesia, and Hawaii.

Callyodon hornbosteli Fowler (fig. 61).

Callyodon hornbosteli Fowler: B. P. Bishop Mus., Bull. 22, p. 16, 1925 (type loc., Guam).—Fowler: op. cit., Bull. 38, p. 26, 1927 (Laysan).

Apparently allied with *Callyodon dubius* but differing in coloration. Black spot at front of spinous dorsal.

Type in the B. P. Bishop Museum and one specimen from Laysan known.

Callyodon globiceps (Valenciennes).

Scarus globiceps Valenciennes: Hist. nat. Poiss., vol. 14, p. 179, 1839 (type loc., Tahiti).—Jenyns: Voyage "Beagle," Fishes p. 106, 1842 (Tahiti).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 527, 1900 (Samoa).

Pseudoscarus globiceps Günther: Cat. fishes Brit. Mus., vol. 4, p. 224, 1862 (Tahiti).—Guichenot: Soc. Cherbourg, Mem., vol. 11, p. 42, 1865 (type).—Streets: U. S. Nat. Mus., Bull., no. 7, p. 80, 1877 (Fanning Islands).—Steindachner: Akad. Wiss. Wien, Denk., vol. 41, pt. 1, p. 19, 1879 (Kingsmills and Society Islands).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 311, 1909 (Ponapé; Samoa; Kandavu; Tahiti; Kingsmills; Society Islands).

Callyodon globiceps Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1400, 1906 (Savaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 35, 1925 (Samoa).

Pseudoscarus spilonotus Kner: Akad. Wiss. Wien, Sitz., vol. 58, p. 352, pl. 9, fig. 26, 1867 (type loc., Kandavu, Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Kandavu).

Callyodon spilonotus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 325, pl. 48, fig. 1, 1905 (1906) (Apia and Pago Pago).

Scarus pronus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 490, pl. 18, fig. 3, 1899 (type loc., Thornton Island [wrongly ascribed to the Carolines]).

Callyodon pronus Fowler and Bean: U. S. Nat. Mus., Proc., vol. 62, p. 52, 1922 (type).

Head 2 4/5 to 3 1/4; depth 2 4/5 to 3; D. IX, 10, 1; A. III, 9, 1; scales 17 to 20 in upper section of lateral line, 4 or 5 in lower section and 2 on caudal base; 2 scales above lateral line, 6 or 7 below; 5 or 6 predorsal scales; snout 2 2/5 to 2 3/4 in head; eye 7 to 7 3/4; maxillary 4 1/4 to 5 2/5; interorbital 2 3/5 to 2 7/8.

Head width 2 to 2 1/8 in its length. Snout convex in profile, though with slight depression above nostrils. Posterior canines variable, 2 upper and 1 lower each side, sometimes 1 upper left and 2 lower, others with 2 above and below on right side, still others with 1 lower each side and 2 upper left and upper right. Interorbital evenly convex. Gill rakers 18 + 30, slender, flexible, 5 1/5 in gill filaments, which 1/5 of head. Scales with 34 basal radiating striae, 39 to 42 apical. Cheek with 2 rows of scales and 1 or 2 more scales on flange of preopercle. Each tube of lateral line with 3 or 4 short branches. Caudal emarginate, corners pointed.

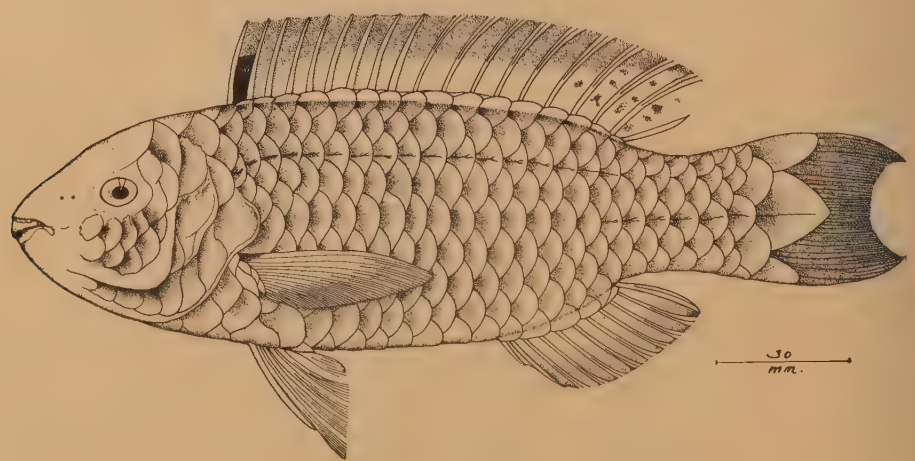

FIGURE 61.—Drawing of *Callyodon hornbosteli.*

More or less dull brown. Most of body, at least above, finely dotted or spotted with pale brownish. Yellow line from front of eye, above nostrils, across interorbital and level with upper eye edge. Parallel yellow line nearly level with lower eye edge forward near snout end, below and including all lower portion of snout, suborbital and cheek, more or less yellowish. Fins pale, all more or less faded. Upper pectoral edge pale or yellowish-brown, with submarginal brownish parallel band, base slaty and rest of fin more or less whitish. Dorsals and anals each with marginal grayish bands. Slaty-black blotch basally on spinous dorsal at third and fourth membranes. Some with median row of grayish blotches on soft dorsal.

In the Academy 2 from Samoa through H. C. Caldwell, larger 260 mm., 1 from Apia and type of *Scarus pronus*. The National Museum has 2 from the Fanning Islands through T. H. Streets and 3 from Apia. In the Agassiz Museum 6 from the Society Islands and 1 from the Kingsmills, all through Andrew Garrett, and adult from Apia.

Zanzibar, Mauritius, Japan, Micronesia, Polynesia.

Callyodon hypselopterus (Bleeker).

Scarus hypselopterus Bleeker: Nat. Tijds. Ned. Ind., vol. 4, p. 496, 1853 (type loc., Batavia, Java).

Pseudoscarus hypselopterus Steindachner: Akad. Wiss. Wien, Denk., vol. 41, pt. 1, p. 19, 1879 (Society Islands).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 311, 1909 (compiled).

Head 3; depth 2 3/5; D. IX, 10, 1; A. III, 9, 1; scales 19, 7 or 8 in lateral line to caudal base and 2 more on latter; 2 scales above, 6 below, 7 predorsal; snout 2 1/6 in head; eye 7 5/6; maxillary 4; interorbital 3 1/4.

Body elongately ovoid, well compressed. Caudal peduncle strongly compressed, least depth slightly less than its length or 2 1/4 in head.

Head width 2 1/6 in its length. Snout conic, upper profile convex and then slightly concave, width 1 2/5 in its length. Eye small, front pupil edge about midway in head length; diameter 4 in snout, 2 1/3 in interorbital. Mouth moderately small, gape 2 3/5 to eye. Lips wide, largely cover teeth. Upper posterior canines 2 each side, none below. Nostrils very small, close together; front one at last fourth in snout. Interorbital convexly elevated. Gill rakers 8 + 28, lanceolate, 1/4 of gill filaments, 1/3 of snout.

Scales with 23 basal radiating striae; apical 62; circuli very fine. Cheek with 3 rows of scales, of which 2 scales on preopercle flange. Lateral line continuous, upper section concurrent with dorsal profile and lower begins 4 scales before last scale of upper; tubes slender, with 3 to 8 branchlets. First dorsal spine 2 3/4 in head; ninth 3 1/10; first dorsal ray 2 2/3; third anal spine 3 1/10; first anal ray 2 3/4; caudal 1 1/5, deeply emarginate, points exserted above and below; pectoral 1 2/5; ventral 1 7/8.

Nearly uniform cream-buff, traces of pale greenish on back. Teeth pale buff. Dorsal and anal edges each with very pale submarginal gray or brown line entire extent. Length 385 mm.

In the Agassiz Museum 1 from the Society Islands?, obtained by Andrew Garrett. At present no traces of the 2 blue lines across the chin as shown in Bleeker's figure (Atlas ichth., vol. 1, pl. 8, fig. 3, 1862). This also differs in showing 3 scales on the preopercle flange, caudal nearly truncate behind and lateral line discontinuous or scale separating upper and lower sections, latter beginning opposite last scale of upper section. As Bleeker points out, the front dorsal spines are longer than the posterior. He had but a single example 230 mm. long from Batavia.

Callyodon nuchipunctatus (Valenciennes).

Scarus nuchipunctatus Valenciennes: Hist. nat. Poiss., vol. 14, p. 166, 1839 (type loc., Sea of the Indies).

Pseudoscarus nuchipunctatus Schmeltz: Mus. Godeffroy, Cat. 4, p. 23, 1869 (Kandavu).—Steindachner: Akad. Wiss. Wien, Denk., vol. 41, pt. 1, p. 19, 1879 (Kingsmills and Society Islands).—Günther: Rept. voyage "Challenger," vol. 1, p. 36, 1880 (Kandavu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 589, 1882 (New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 323, pl. 157, 1909 (Pelew Islands, Fiji, Samoa, Society Islands, Kingsmills, Yap, Ponapé).

Callyodon nuchipunctatus Fowler and Bean: U. S Nat. Mus., Bull., no. 100, p. 487, 1928 (Apra Bay on Guam, New Guinea, type of *C. maoricus*).

Scarus prasiognethos Valenciennes: Hist. nat., Poiss., vol. 14, p. 202, 1839 (type loc., New Ireland).

Pseudoscarus prasiognathus Guichenot: Soc. Cherbourg, Mem., vol. 11, p. 56, 1865 (type).

Callyodon prasiognathus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 328, 1905 (1906) (Pago Pago; part).

?*Scarus makaravar* Thiollière: Fauna Woodlark, p. 197, 1857 (type loc., Woodlark Island).

Callyodon maoricus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 328, pl. 48, fig. 3, 1905 (1906) (type loc., Pago Pago).

Callyodon niger (non Forskål) Steindachner: Akad. Wiss., Wien, Sitz., vol. 115, pt. 1, p. 1400, 1906 (Upolu).

Head 3; depth 2 1/3 to 2 3/4; D. IX, 10, 1; A. II, 10, 1; scales 18 or 19 in upper section of lateral line, 4 or 5 in lower section to caudal base and 2 more on latter; 2 scales above, 6 or 7 below, 7 or 8 predorsal; snout 2 1/8 to 2 1/4 in head; eye 6 to 9; mouth cleft 5 to 5 4/5; interorbital 2 3/4 to 3.

Body oblong, ovate, well compressed. Caudal peduncle compressed, length 3/4 its least depth, which 2 in head.

Head width 2 1/5 to 2 1/3 in its length. Snout convex, width 1 1/6 in its length. Eye midway in head length; diameter 4 1/5 in snout, 3 1/3 in interorbital. Mouth small, maxillary groove midway in snout length. Lips largely cover teeth. Single upper canine each side posteriorly. Nostrils close together; front one at last fifth in snout. Interorbital convexly elevated. Gill rakers 12 + 30, fine, flexible, 3 3/4 in gill filaments, which 2 1/2 in snout.

Scales with 31 basal radiating striae; apical 46; circuli very fine. Scales on cheek in 3 rows, lowest row of 4 or 5 smaller scales along preopercle flange. Tubes in lateral line large, rather short and with but few branches. First dorsal spine 3 in head; first dorsal ray 3 1/3; second anal spine 3 3/4; first anal ray 3 1/4; caudal 1 1/8, emarginate, double concave as expanded; pectoral 1 1/8; ventral 1 2/5.

Deep dusky chocolate, each scale on front of body indistinctly with blackish spot. Greenish line across upper lip and 2 across lower; greenish line from mouth to eye; buff blotch below suprascapula. Dorsals and anals each with narrow brown or buff edges. Length 228 to 368 mm.

In the Agassiz Museum 2 from the Hawaiian islands. Also 1 from the Kingsmills, 247 mm. long, obtained by Andrew Garrett. It has no canines and 3 scales on preopercle flange. In the

National Museum 2 from New Guinea. They resemble Bleeker's figure, but are without the black spots on the body scales and large post-orbital pale blotch. Length 202 to 228 mm. Also type of *Callyodon maoricus*.

Scarus makaravar Thiollière, imperfectly noticed as follows, may be this species:

Head deeper than long, profile straight. Jaws denticulated. Teeth apparently covered by lips. Opercle elongated to point above pectoral. Scales large. Dorsal little higher in front than behind. Anal moderately high, base somewhat extended. Caudal long, narrowly rounded. Green on back and tail, with black spots. Green more pale below, with yellow streaks. Length 200 mm.

Zanzibar, East Indies, Riu Kiu, Melanesia, Micronesia, Polynesia.

Callyodon ghobban (Forskål).

Scarus ghobban Forskål: Descriptiones animalium, pp. x, 28, 1775 (type loc., Djedda, Red Sea).

Pseudoscarus ghobban Schmeltz: Mus. Godeffroy, Cat. 6, p. 17, 1877 (Tahiti).

Pseudoscarus cantori Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 589, 1882 (New Guinea).

Pseudoscarus pyrrhostethus Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 308, 1909 (Ponapé).

Cheek with 3 rows of scales, of which lowest row of 5 scales on preopercle flange. Posterior canines absent. Generally green with bluish spots and bars on head. Fins all pink, verticals margined blue and dorsals often with median row of blue spots.

Red Sea, India, East Indies, China, Queensland, Micronesia, Polynesia.

Callyodon guttatus (Schneider).

Scarus guttatus Schneider: Systema ichth., Bloch, p. 294, 1801 (type loc., Indian Seas). (On Sonnerat, Jour., Physique, vol. 3, p. 22, pl. 2, 1774.)

Callyodon guttatus Fowler and Bean: U. S. Nat. Mus., Bull., no. 100, p. 493, 1928 (Samoa).

Pseudoscarus singapurensis Waite: Australian Mus., Mem., no. 3, p. 194, 1897 (Funafuti, Ellice Islands).

Pseudoscarus singaporensis Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 325, 1909 (Ponapé).

Callyodon prasiognathus (part) Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 328, 1905 (1906) (Samoa).

Pseudoscarus brevifilis Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 327, pl. 161, 1909 (type loc., Tahiti; Apamana, Gilberts).

Two specimens in the National Museum as *Callyodon prasiognathus* from Samoa have similar color to *Callyodon brevifilis* when compared. The bright spots Günther figures are all distinct. There are, however, no posterior canines. One shows the tip of the first dorsal ray slightly exserted, a character Günther sets forth with his *Pseudoscarus altipinnis* to separate them from most scaroids. The above specimens 220 and 240 mm.

East Africa, Mauritius, East Indies, Micronesia, Polynesia.

Callyodon muricatus (Valenciennes).

Scarus muricatus Valenciennes, Hist. nat. Poiss., vol. 14, p. 154, pl. 402, 1840 (type loc., Java).

Pseudoscarus muricatus Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 316, 1909 (Ponapé, Pelew Islands, Solomons, Samoa).

Upper profile of head very gibbous above eye; teeth exposed; no canines; 3 rows of cheek scales of which lowest as 1 or 2 scales on preopercle flange; uniform brown. Reaches 500 mm.

Likely the reference to *Pseudoscarus striatus* Schmeltz (Mus. Godeffroy, Cat. 4, p. 23, 1869, Samoa) from Samoa refers to this species. The figure of *Scarus cretensis* Bloch, the basis of *Scarus striatus* Valenciennes (Hist. nat. Poiss., vol. 15, p. 155, 1850, type loc., East Indies?) is greatly suggestive of this species.

East Indies, Melanesia, Micronesia, Polynesia.

Callyodon bicolor (Rüppell).

Scarus bicolor Rüppell: Atlas Reis. Nord. Afrika, Fische, p. 82, pl. 21, fig. 3, 1828 (type loc., Djedda, Red Sea).

Pseudoscarus bicolor Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 305, 1909 (Ponapé).

Readily known by the greater lower portions dark gray mottled in strong contrast with blackish, the back pale.

In the National Museum only a head, 135 mm. long, of a large specimen, obtained in the Taumotus by the Wilkes Expedition. The scales on the cheek in 3 rows between the eye and the preopercle angle.

Red Sea, East Indies, Riu Kiu, Micronesia and Polynesia. Reaches 500 mm. or more.

RHYACICHTHYIDAE

Rhyacichthys aspro (Valenciennes).

Platyptera aspro (Kuhl and Van Hasselt) Valenciennes: Hist. nat. Poiss., vol. 12, p. 240, pl. 360, 1837 (type loc., Fresh waters of Bantam).—Günther: Cat. fishes Brit. Mus., vol. 3, p. 138, 1861 (Wanderer Bay, Solomons).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 191, 1877 (same specimen).

Rhyacichthys aspro Weber: Nova Guinea, vol. 9, pt. 4, p. 599, 1913 (Bégowre River at Salzquelle, North New Guinea).

Platyptera melanocephala (Kuhl and Van Hasselt) Cuvier: Regne animal, 2nd ed., vol. 2, p. 248, 1829, (type loc., Indies) (no description).

Platyptera trigonocephala (Kuhl and Van Hasselt) Cuvier: Regne animal, 2nd ed., vol. 2, p. 248, 1829 (type loc., Indies) (no description).

Rhiacichthys novae-guineae Boulenger: Zool. Soc. London, Proc., pt. 1, p. 124, pl. 11, 1903 (type loc., Dinawa, Owen Stanley Range at 4000 feet, British New Guinea).

Head 5; depth 5; D. VII—I, 8 or 9; A. I, 8 or 9; scales 37 to 39, 9 transversely; snout 1 4/5 in head; eye 6 to 7; mouth width 2; interorbital 3. Scales strongly ciliated, smaller on predorsal, head above and opercles. Second dorsal spine 1 2/5 in head; first branched ray 1 1/5; first branched anal ray 1; caudal peduncle depth 1 2/3; caudal emarginate, 4 1/2 in combined head and body; pectoral 4; ventral 4 1/5. Dark olive above, whitish beneath. Length 225 mm. (Boulenger)

East Indies, Melanesia.

ELEOTRIDAE

Bostrichthys sinensis (Lacépède).

Bostrychus sinensis Lacépède: Hist. nat. Poiss., vol. 3, pp. 140, 141, 1802 (type loc., China); op. cit., vol. 2, pl. 14, fig. 2, 1800.

Eleotris sinensis Günther: Cat. fishes Brit. Mus., vol. 3, p. 128, 1861 (fresh waters of Oualan).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 19, 1869 (Kanathia).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 189, 1877 (Ovalau and Kanathia, Fiji).

Head 4 1/3 to 4 1/2 in total; depth 7 1/2 to 8; A. VI—1, 10 to 12; A. 1, 9; scales 140. Head obtuse, broad, depressed, width equals length without snout. Eye 5 in head, 1 1/2 in snout, 2 in interorbital. Mandible protrudes. Maxillary reaches hind eye edge. Teeth in villiform bands in jaws; semioval patch on vomer. Front nostril tubular, long. Scales cycloid, rudimentary on head above and nape, small on cheeks, larger on opercles. First dorsal lower than second. Caudal rounded or cuneate. Paired fins subequal, long as head without snout.

Marbled dark brown. Black white-edged ocellus at upper part of caudal base and fin vertically banded by spots. Three bands formed by spots along dorsal fin. Length 114 mm. (Day).

One from New Guinea in the National Museum.

Andamans, East Indies, China.

Bostrichthys zonatus (Weber).

Bostrychus zonatus Weber: Nova Guinea, vol. 5, pt. 2, p. 259, pl. 12, fig. 1, 1908 (type loc., Merauke, South New Guinea).

Head 3 2/5; depth 4 3/4; D. IX or X, 17 or 18; A. 13; scales 150, 35 transversely. Eye 7 1/2 in head, 2 in snout, 2 in interorbital. Mouth little inclined, jaws equal. Maxillary reaches little beyond eye. Rows of small and larger teeth in jaws and semioval patch of conic teeth on vomer. Scales cycloid. First dorsal lower than second, height less than half body depth; height of second dorsal 2/3 body depth. Caudal rounded, equals head without snout; paired fins shorter. Dark brown, reddish-white below. Body with 8 or 9 broad nearly complete dark brown bands; parallel dark narrow streak within pale intervals. Row of dark spots transversely on caudal basally. Dorsals and anal with lighter blotches and marbling, edged whitish. Paired fins dark. Length 150 mm. (Weber)

Odontoeleotris nesolepis (Weber).

Eleotris (Odontoeleotris) nesolepis Weber: Nova Guinea, vol. 5, pt. 2, p. 256, 1908 (type loc., Tawarin River and Tinena Brook, North New Guinea).

Head 4 1/2 in total; depth 6 to 7; D. VI—12; A. 9 or 10; scales 45, 16 transversely. Snout obtuse, long as eye which 4 in head. Mouth oblique, mandible protruded. Maxillary reaches eye. Teeth fine, pluriserial, 8 canines in each jaw. Scales ctenoid, anteriorly on body cycloid; 22 predorsal rows to eye and 2 or 3 rows on opercle above. Second dorsal 2/3 body depth, first dorsal and anal shorter. Caudal and pectoral long as head, former rounded. Ventral long as postocular. Clear lower part of body separated from yellowish-brown back by dark longitudinal band, and above 7 or 8 obscure dark crossbands. Dark band from snout through eye to opercle. Dorsals and upper half of caudal with rows of dark dots, other fins all clear. Reaches 50 mm. (Weber)

Guavina gyrinoides (Bleeker).

Eleotris gyrinoides Bleeker: Nat. Tijds. Ned. Ind., vol. 4, p. 272, 1853 (type loc., Benculen and Priaman, Sumatra).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 188, 1877 (Pelew Islands).—Ramsay and Ogilby: Linn. Soc. New South Wales, Proc., 2nd ser., vol. 1, p. 8, 1886 (Strickland River, New Guinea).—Weber: Nova Guinea, vol. 5, pt. 2, p. 254, 1908 (Mosa and Tawarin River, North New Guinea).—Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 135, 1913 (Waisa, Waigiu).

Head 3; depth 4 1/2; D. VI—I, 8, 1; A. 1, 8, 1; scales 54 in median lateral series to caudal base; 18 scales transversely at soft dorsal origin; 38 predorsal scales; snout 4 2/3 in head measured from upper jaw tip; eye 7 1/3; maxillary 2 1/2; interorbital 3 3/4.

Body compressed, more robust forward. Caudal peduncle strongly compressed, least depth 1 3/5 in its length or 2 1/2 in total head length.

Head width 1 3/4 in its length. Snout broad, convexly elevated, seen as convex prominence in profile, length 2/3 its width. Eye with hind pupil edge at first third in total head length; diameter 1 1/2 in snout, 2 in interorbital. Mouth large, lower jaw protruding. Maxillary reaches opposite eye center; expansion 2 1/2 in eye. Teeth in broad villiform bands in jaws, none on palate. Tongue rounded convexly in front. Front nostril in short tube near snout edge, midway in snout length; hind nostril small pore close before and above front eye edge. Interorbital level.

Gill rakers 3 + 9 tubercles, half of gill filaments, which 1 1/5 in eye.

Scales with 32 to 35 basal radiating striae; apical denticles 36; circuli fine, irregular. Muzzle naked, rest of head scaly. Caudal and paired fins with small scales crowded basally. Anteriorly on body scales all cycloid. Cheek with 3 horizontal grooves, over which scales do not pass.

Third dorsal spine 2 4/5 in head; seventh dorsal ray 2 1/2; seventh anal ray 2 1/8; caudal 1 1/3, rounded behind; pectoral 1 2/3; ventral 1 3/5.

Dark brownish, mottled with paler and dusky. Under surface of head brown, with white marblings or short streaks or spots, especially on branchiostegal region. Fins all dusky, with more or less blackish generally and marbled or mottled with whitish. Anal with especially prominent whitish spots. Length 274 mm.

In the Agassiz Museum 1 from Kusaie, Carolines, obtained by Rev. B. G. Snow.

East Indies, Micronesia.

Oxyeleotris marmorata (Bleeker).

Eleotris marmorata Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 424, 1852 (type loc., Bandjermassing, southeast Borneo; Palembang, southeast Sumatra).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 19, 1869 (Viti Levu).

Head 3 1/2 in total; depth 5 2/3; D. VI—I, 9; A. I, 8; scales 70 to 75, 22 transversely. Snout moderate, depressed, flat. Eye at third eighth of head, 1/2 of interorbital. Mandible prominent. Maxillary to below middle of eye. Teeth in villiform bands. Preopercle without spine. Scales on head minute, leaving snout and lower part of cheek naked; scales ciliated. Yellowish, largely marbled brown. Brown stripes along series of scales. Caudal brown, with lighter spots. Length 89 mm. (Günther)

Siam, East Indies, Polynesia.

Oxyeleotris urophthalmus (Bleeker).

Eleotris urophthalmus Bleeker: Nat. Tijds. Ned. Ind., vol. 2, p. 202, 1851 (type loc., Bandjermassing, Borneo).—Weber: Nova Guinea, vol. 9, pt. 4, p. 596, 1913 (Lorentz and Sermowai Rivers).

Head 4 in total; depth 7 to 8; D. VII—I, 9; A. I, 9; scales 75. Head broad, depressed, obtuse. Eye 6 in head, 2 in interorbital. Mouth cleft extends below orbit. Teeth in villiform bands. Caudal 5 in total. Brownish. Black, red-edged ocellus on caudal base above. (Günther)

East Indies.

Oxyeleotris urophthalmoides (Bleeker).

Eleotris urophthalmoides Bleeker: Nat. Tijds. Ned. Ind., vol. 4, p. 373, 1853 (type loc., Palembang; Lake Meninju, Sambas, West Borneo).—Weber: Nova Guinea, vol. 9, pt. 4, p. 596, 1913 (Sermowai River, North New Guinea).

Eleotris (Oxyeleotris) urophthalmoides Weber: Nova Guinea, vol. 5, pt. 2, p. 255, 1908 (Kambo Kèper and Tawarin River, North New Guinea; Wagani River; South New Guinea).

Head 3 2/3 to 4 1/4 in total; depth 6 1/4 to 7; D. VI—I, 9; A. I, 8; scales 60. Head broad, depressed. Eye 6 or 9 in head, 2 in interorbital. Maxillary reaches below eye. Teeth in villiform bands, outer series enlarged. Scales on head and neck very small. Caudal 5 in total length. Brownish, with darker longitudinal streaks. Black, red-edged, ocellus, on upper part of caudal base. (Günther)

East Indies.

Oxyeleotris lineolatus (Steindachner).

Eleotris lineolatus Steindachner: Akad. Wiss. Wien, Sitz., vol. 55, pt. 1, p. 13, 1867 (type loc., Rockhamton, east Australia).

Oxyeleotris lineolatus McCulloch and Ogilby: Australian Mus., Records, vol. 13, p. 265, 1919 (type of *Eleotris immaculatus* Macleay).

Eleotris immaculatus Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 268, 1883 (type loc., Kéremma River, Gulf of Papua).

Eleotris (Oxyeleotris) heterodon Weber: Nova Guinea, vol. 5, pt. 2, p. 255, pl. 13, fig. 7, 1908 (type loc., Sentani Lake and Möso, North New Guinea).

Eleotris heterodon Weber: Nova Guinea, vol. 9, pt. 4, p. 596, 1913 (Lake Sentani, Njao, Lorentz River).

Head 2 4/5; depth 5; D. VI, 10; A. 9; scales 60, 20 transversely. Head depressed, broader than deep. Eye 9 in head, 1 9/10 in snout, 2 1/3 in interorbital. Mouth oblique, mandible produced. Maxillary reaches below last fourth of eye. Bands of villiform teeth in jaws, outer rows little enlarged, also inner lower row. Tongue rounded. Interorbital 3 1/8 in head. No preopercular spine. Scales ctenoid, smaller on nape, breast and pectoral base, also extend on caudal and pectorals between rays. Head with numerous minute papillae, largely hidden among scales. Caudal rounded. Dark brown, without definite markings. Length 480 mm. (McCulloch and Ogilby)

East Indies, Queensland.

Oxyeleotris aruensis (Weber).

Eleotris (Oxyeleotris) aruensis Weber: Senckenberg. Naturf. Gesell., Abhandl., vol. 34, p. 33, pl. 1, fig. 5, 1911 (type loc., Ngaiguli, Terangan; Kobroor, Aru Islands).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 135, 1913 (Beo and Wai Menil, Waigiu).

Differs from *O. urophthalmus* in D. VI—12 and scales 56.

Ophiocara ophicephalus (Valenciennes).

Eleotris ophicephalus (Kuhl and Van Hasselt) Valenciennes: Hist. nat. Poiss., vol. 12, p. 180, 1837 (type loc., Java).

Eleotris opiocephalus Pietschmann: Nassau. Ver. Nat. Jahrb., (Wiesbaden), pt. 66, p. 198, 1913 (Kaiser Wilhelm's Hafen, German New Guinea).

Ophiocara ophiocephalus Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 11, p. 28, 1877 (New Guinea).

Eleotris margaritacea Valenciennes: Hist. nat. Poiss., vol. 12, p. 181, 1837 (type loc., Vanicolo).

Head 2 3/4; depth 4 4/5; D. VI-I, 8, 1; A. I, 7, 1; scales 32 in median lateral series to caudal base and 11 more on latter; 12 scales transversely from soft dorsal to anal origins; 22 predorsal scales; snout 3 1/2 in head, measured from upper jaw tip; eye 6 1/3; maxillary 2 2/5; interorbital 3.

Body well compressed, more robust forward. Caudal peduncle strongly compressed, least depth 1 1/4 in its length or 2 2/5 in total head length.

Head width 1 3/5 in its length. Snout broad, in profile with slight convex median prominence, depressed, length half its width. Eye with center at first third in total head length; diameter 1 2/3 in snout, 2 1/6 in interorbital. Mouth large, lower jaw protruding. Maxillary reaches opposite eye center. Teeth villiform, in rather broad bands in jaws, none on palate. Tongue smooth, rounded obtusely and free in front. Front nostril in tube near edge of snout, midway in snout length; hind nostril close before eye, closer to latter than to front nostril.

Gill rakers 4 + 11, lanceolate, equal gill filaments or 2 1/3 in eye.

Scales with 17 to 29 basal radiating striae; apical denticles 110 to 112; circuli fine. Muzzle naked, rest of head scaled. Cheek with 2 horizontal rows of minute pores and 2 short postocular rows; scales on lower cheek small. Caudal and paired fins with small scales, crowded basally.

Second dorsal spine 1 9/10 in total head length; eighth dorsal ray 1 2/5; seventh anal ray 1 2/3; caudal 1 1/10, rounded behind; pectoral 1 2/5; ventral 1 2/5.

Deep olive-brown, little paler or more brownish on belly and under surface of head. Sides with dark or neutral-black spots scattered at bases of some scales. Dorsals and caudal deep vandyke-brown; soft dorsal with upper edge pale to whitish and membranes of fin with fine scattered neutral-dusky spots; caudal also finely spotted with dusky. Anal like soft dorsal. Paired fins dull brown. Iris brownish. Length 245 mm.

One in the Agassiz Museum from Kusaie, Carolines, obtained by the *Albatross*. Also 1 in the National Museum from Kusaie.

East Africa, Mozambique, Seychelles, India, Andamans, East Indies, Philippines, Melanesia, Micronesia.

Ophiocara macrolepidotus (Bloch).

Sciaena macrolepidota Bloch: Nat. ausländischen Fische, pt. 6, p. 40, pl. 298, 1792 (type loc., East Indies).

Eleotris macrolepidotus Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 361, 1882 (New Guinea).

Eleotris macrolepidota Günther: Rept. voyage "Challenger," vol. 1, p. 35, 1880 (Ovalau, Fiji):

Eleotris porocephala Valenciennes: Hist. nat. Poiss., vol. 12, p. 178, 1837 (type loc., Seychelles; New Ireland).—Weber: Nova Guinea, vol. 9, pt. 4, p. 593, 1913 (Kajó Bay in West Humboldt Bay).

Eleotris porocephalus Schmeltz: Mus. Godeffroy, Cat. 4, p. 19, 1869 (Kanathia).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 185, pl. 112, fig. A, 1877 (Carolines; Pelew Islands; Vanicolo; New Ireland).—Macleay: Linn. Soc. New South Wales, Proc., vol. 4, p. 63, 1879 (Solomons).—Macleay: op. cit., vol. 8, p. 269, 1883 (Normanby Island in fresh water, New Guinea).—Ramsay and Ogilby: op. cit., 2nd ser., vol. 1, p. 8, 1886 (Strickland River, New Guinea).—Perugia: Mus. Genova, Ann., vol. 34, p. 547, 1894 (Haveri, Horoka District, 700 m., New Guinea).—Boulenger: Linn. Soc. London, Trans., 2nd ser., vol. 12, p. 292, 1907-09 (1908) (Praslin).—Weber and Beaufort: Nova Caledonia (Sarasin and Roux), vol. 2, pt. 1, pp. 32, 41, 1915 (Oubatche: Banks Island).

Ophiocara porocephalus Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 316, 1911 (Kusaie, Carolines).

Eleotris porocephaloides Schmeltz: Mus. Godeffroy, Cat. 4, p. 19, 1869 (Kanathia).

Eleotris cantoris Schmeltz: Mus. Godeffroy, Cat. 4, p. 19, 1869 (Kanathia).—Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, p. 328, 1868 (Kanathia, Viti Islands, Fiji).

Head 4 in total; depth 4; D. VII—I, 8; A. I, 10; scales 30. Head width 3/4 its length. Eye 4 in head, equals snout, 3 in interorbital which swollen, otherwise

upper surface of head flat. Mouth cleft very oblique. Maxillary reaches below front orbit edge. Teeth villiform. Scales finely ctenoid on body, very small on head above, 25 to 28 predorsal. Brownish, with brown spots on second dorsal. Reaches 208 mm. (Day)

The National Museum has 3 from Fiji, obtained by the Wilkes Expedition. Also 1 from Kusaie collected by the *Albatross*. In the Agassiz Museum 1 from Kusaie.

Under *Eleotris* from Kanala, New Caledonia, Jouan evidently describes this species (Soc. Cherbourg, Mem., vol. 8, p. 254, 1861): D. VI, 10; A. 8. Reddish black, with bluish-white dots disposed in longitudinal lines between second dorsal and anal. Second dorsal, anal and caudal bordered orange-red. Length 210 mm.

Seychelles, India, East Indies, Melanesia, Micronesia, Polynesia.

Ophiocara aporos (Bleeker).

Eleotris aporos Bleeker: Nat. Tijds. Ned. Ind., vol. 6, p. 59, 1854 (type loc., Sindangole, Halmaheira).—Schmeltz: Mus. Godeffroy, Cat. 4, pp. 18, 19, 1869 (Ovalau; Kanathia).

Eleotris aporus Günther: Cat. fishes Brit. Mus., vol. 3, p. 109, 1861 (Oualan; Fiji; Wanderer Bay, Aneiteum).—Weber: Nova Guinea, vol. 5, pt. 2, p. 252, 1908 (Lake Sentani and Mŏso, North New Guinea).—Weber: op. cit., vol. 9, pt. 4, p. 593, 1913 (Lake Sentani and near Cape Djnar on Humboldt Bay).

Ophiocara aporos Ogilby: Linn. Soc. New South Wales, Proc., vol. 22, p. 769, 1897 (New Caledonia).—McCulloch and Ogilby: Australian Mus., Records, vol. 13, p. 275, 1919 (Gazelle Peninsula, New Britain; Solomons; Fiji).

Eleotris macrolepidotus (non Bloch) Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 186, 1877 (part).

Head 3; depth 5; D. VI-9; A. 10; scales 29, transversely 10. Head much broader than deep, flat above. Snout broadly rounded. Eye 7 in head, 3 in interorbital, much shorter than snout, lateral, high. Mouth oblique, mandible protruded. Maxillary reaches below first third of eye. Bands of villiform teeth in jaws, outer row strong. Tongue subtruncate. Scales mostly ctenoid, but cycloid on breast and pectoral base; extend up between bases of pectoral and caudal rays; superciliary scales present; preopercle edge hidden by scales; 16 predorsal. Caudal broadly rounded.

Brown above, white below. Two dark bars obliquely downward from opercle, third crosses opercle to pectoral base and with light patch in its upper portion also dark bar followed by lighter one at bases of rays. Fins dark, dorsals, and ventral with broad light edge. Length 284 mm. (McCulloch and Ogilby)

East Indies, Queensland, Melanesia, Micronesia, Polynesia.

Ophiocara hoedtii (Bleeker).

Eleotris hoedtii Bleeker: Nat. Tijds. Ned. Ind., vol. 6, p. 496, 1854 (type loc., Amboina rivers).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 18, 1869 (Viti Levu).

Eleotris hoedti Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).—Weber: Nova Guinea, vol. 5, pt. 2, p. 253, 1908 (Tributary of Humboldt Bay, Manăpiri, Klipong River, Tawarin River and North New Guinea).—Weber: op. cit., vol. 9, pt. 4, p. 593, 1913 (Lorentz River, Mbai River, Humboldt Bay).—Weber and Beaufort: Nova Caledonia (Sarasin and Roux), Zool., vol. 2, pt. 1, p. 32, 1915 (Oubatche in fresh water).

Ophiocara hoedti Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 38, 1878 (New Guinea).

Eleotris (Ophiocara) hoedti Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 135, pl. 2, figs. 6-7, 1913 (Waiha, brook at Mumes and Waisa River, Waigiu).

Eleotris kuak Thiollière: Fauna Woodlark, p. 187, 1857 (type loc., Woodlark Island).

Eleotris macrolepidotus (non Bloch) Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 186, 1877 (Pelew Islands; Fiji; New Hebrdies).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 14, 1877 (Pelew Islands).

Eleotris macrocephalus (non Bleeker) Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, pl. 112, figs. B, B', B'', 1877.

Head 3 1/4; depth 4; D. VI-I, 8; A. I, 8 or 9; scales 32 to 38, 10 or 11 transversely. Head obtuse, flat, depressed. Snout 4 3/4 in head from snout tip; eye 5 1/2, 1 1/5 in snout, 2 3/4 in interorbital. Lower jaw protruded. Maxillary nearly or quite to front eye edge. Teeth in villiform bands. Head scaly, except foremost part of snout; scales on upper surface of head not smaller than those on body. Fifth dorsal spine 1 7/8 in total head length, sixth branched ray 2 3/4 in combined head and body; seventh branched anal ray 1 1/4 in head; caudal peduncle depth 1 7/8; caudal 1, rounded; pectoral 1 1/3; ventral 1 1/10.

Brownish-green with 2 or 3 rows of large dark blotches on side, forming dark longtitudinal band in young. Three oblique dark bands from eye to pectoral base. Body and vertical fins frequently with pearly spots. Fins brownish. Reaches 305 mm. (Günther)

Evidently *Eleotris kuak* Thiollière is intended for this species. It is said to be black with white spots; likewise the reference to *Eleotris* by Jouan (Soc. Cherbourg, Mem., vol. 8, p. 254, 1861, Kanala) based on a specimen from New Caledonia, 210 mm. long.

Andamans, East Indies, North Australia, Melanesia, Micronesia, Polynesia.

Mogurnda mogurnda (Richardson).

Eleotris mogurnda Richardson: Voyage "Erebus" and "Terror," Ichth., p. 4, pl. 2, figs. 1-2, 1848 (type loc., Port Essington, North Australia).—Perugia: Mus. Genova, Ann., vol. 34, p. 547, 1894 (Inawi, Rio San Guiseppe district, Makeo; Haveri, Moroka district, 700 m., New Guinea).—Weber: Nova Guinea, vol. 5, pt. 2, p. 253, 1908 (Wagani and Merauke River, South New Guinea).—Weber: op. cit., vol. 9, pt. 4, p. 593, 1913 (Merauke, Sabang, Lorentz River, Alkmaar, Salzquelle, Sermowai River).—Regan: Zool. Soc. London, Trans., vol. 20, pt. 6, p. 276, 1914 (Mimika River, New Guinea).

Head 3 1/5; depth 3 1/2; D. VIII or IX-12 or 13; A. 11 to 14; scales 38 to 42, 15 or 16 transversely; snout 4 1/5 in head; eye 5; interorbital 2 3/4, nearly twice eye. Snout broadly rounded. Mandible projecting. Mouth oblique. Maxillary reaches below first third of eye. Broad band of villiform teeth in each jaw; palate toothless. Tongue rounded. Head largely covered with cycloid scales, extend forward between hind nostrils, snout and mandible naked. Rows of minute pores from above nostrils, over and behind eye, to groove above opercles; others cross cheek and opercle and extend around preopercle edge on to mandible. Some small, imperfect scales on upper part of eye. Body covered with ctenoid scales extending over breast and pectoral bases, little smaller anteriorly. Caudal broadly rounded.

Light brown, with numerous darker spots along middle of sides, which coalesce posteriorly into 2 longitudinal lines enclosing large darker and lighter blotches. Two oblique stripes cross cheek from eye, continued across opercle; third crosses opercle and pectoral base

to dark blotch on bases of rays. First dorsal dusky, with some obscure spots, border white. Second dorsal dusky, border white and numerous large darker spots near base and on hind rays, where mingling with some lighter markings. Anal like second dorsal. Caudal with dark spots between rays medially, which largest basally. Length 120 mm. (McCulloch and Ogilby)

North and Central Australia, Aru?, New Guinea.

Eleotris fusca (Schneider).

Poecilia fusca Schneider: Systema ichth., Bloch, p. 453, 1801 (type loc., Oriadeae insulae rivulis).

Eleotris fusca Günther: Cat. fishes Brit. Mus., vol. 3, p. 125, 1861 (Aneiteum and Oualan in fresh water).—Kner: Reise "Novara," Fische, vol. 2, p. 186, 1865 (Tahiti).—Günther: Cruise of "Curaçoa" (Brenchley), p. 410, 1873 (Solomons).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 28, 1874 (Viti Levu).—Schmeltz: op. cit., Cat. 6, p. 14, 1877 (Vavao).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 188, 1877 (Solomons; New Hebrides; Samoa; Society Islands).—Günther: Rept. voyage "Challenger," vol. 1, pp. 35, 58, 60, 1880 (Levuka, Fiji; Papeete, Tahiti; fresh water of Honolulu).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 229, 1898 (Saypan, Guam).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 124, 1900 (Guam).—Seale: op. cit., vol. 1, no. 5, pp. 17, 19, 20, 1902 (Honolulu).—Seale: op. cit., vol. 4, no. 1, p. 84, 1906 (Tahiti; Tubuai; Nukuhiva).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, no. 1, p. 1406, 1906 (Upolu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 383, 1905 (1906) (Apia; Vaimosa; Pago Pago).—Pietschmann: Nassau. Ver. Nat. Jahrb. (Weisbaden), pt. 66, p. 199, 1913 (Friedrich-Wilhelms-Hafen, New Guinea).——Weber and Beaufort: Nova Caledonia (Sarasin and Roux), Zool., vol. 2, pt. 1, p. 33, 1915 (Oubatche; Bonde; Tshalabel River; Tao; Canala).—McCulloch and Ogilby: Australian Mus., Records, vol. 13, p. 268, 1919 (Oubatche, New Caledonia; Santo, New Hebrides; Samoa).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 17, 30, 35, 38, 1925 (Guam; Honolulu; Samoa; Tahiti).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 26, 1925 (Palmyra Island).—Fowler and Bean: United States Nat. Mus., Proc., vol. 71, p. 15, 1928 (Tahiti).

Eleotris (Culius) fusca Schmeltz: Mus. Godeffroy, Cat. 4, p. 18, 1869 (Viti Levu).—Weber: Nova Guinea, vol. 5, pt. 2, p. 257, 1908 (Klipong River, Mamŭpiri, Mawi, Mŏso, North New Guinea; Muturi, West New Guinea; Ron Island).

Eleotris fuscus Ogilby: Linn. Soc. New South Wales, Proc., vol. 22, p. 769, 1897 (New Caledonia).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., pp. 516, 523, 1900 (Honolulu; Tahiti).—Weber: Nova Guinea, vol. 9, pt. 4, p. 596, 1913 (Mbai River, Sĕkå, Biwak).

Eleotris (Culius) fuscus Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 136, 1913 (Waihä River, Mumes brook, Rabai River, branch Bayon River, Waisa River, Waigiu).

Culius fuscus Streets: U. S. Nat. Mus., Bull., no. 7, p. 57, 1877 (fresh waters of Oahu).

Cobitis pacifica (Forster) Schneider: Systema ichth., Bloch, p. 453, 1801 (type loc., Tahiti).—Lichtenstein: Descriptiones animalium, p. 235, 1844 (Oriadea).

Eleotris niger Quoy and Gaimard: Voyage "Uranie," Zool., p. 259, pl. 60, fig. 2, 1824 (type loc., Waigiu).—Valenciennes: Hist. nat. Poiss., vol. 12, p. 175, 1837 (Guam; Waigiu; Tahiti; Borabora).

Eleotris sandwichensis Vaillant and Sauvage: Rev. Mag. Zool., 3rd ser., vol. 3, p. 280, 1875 (type loc., Hawaiian islands).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 499, 1902 (1903) (Honolulu; Hilo).—Snyder: op. cit., p. 536, 1902 (1904) (Honolulu; Waimea River; Hanalei River; Huleia River; Hanapepe River; Anahulu River).

Eleotris sandwicensis Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 479, fig. 210, 1903 (1905) (Honolulu; Waianae; Waialua; Moanalua; Moana Hotel; Waikiki; Hilo; Kailua).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 77, Dec. 1922 (Hawaii).

Gobius homocyanus Vaillant and Sauvage: Rev. Mag. Zool., 3rd ser., vol. 3, p. 280, 1875 (type loc., Hawaiian islands).

Glossogobius giuris (non Buchanan-Hamilton) Streets: U. S. Nat. Mus., Bull., no. 7, p. 60, 1877 (coral reefs at Oahu).

Eleotris (Giuris) vanicolensis Sauvage: Soc. Philom. Paris, Bull., 7th ser., vol. 4, p. 54, 1879 (type loc., Vanikoro).

Eleotris (Culius) vitianus Sauvage: Soc. Philom. Paris, Bull., 7th ser., vol. 4, p. 56, 1879 (type loc., Fiji).

Gobius sandvicensis Günther: Rept. voyage "Challenger," vol. 1, p. 60, 1880 (type loc., fresh waters of Honolulu).

Head 2 3/4 to 3; depth 4 1/3 to 6; D. VI-1, 8, 1 or 9, 1; A. 1, 8, 1 or 9, 1; scales 57 or 58 in median lateral series from gill opening to caudal base and 4 to 6 more on latter; 21 or 22 scales transversely; predorsal scales 47 or 48; snout 3 1/4 to 4 7/8 in head from snout tip; eye 3 7/8 to 8 3/4; maxillary 2 1/4 to 2 2/3; interorbital 3 3/4 to 5.

Scales with 15 to 19 basal radiating striae; 25 to 30 + 24 to 29 imbedded apical denticles; circuli minutely irregular. Many transverse lines of pores across snout, 8 from lower eye edge and horizontal line from above end of maxillary. Also many short transverse rows across mandibular rami. In the larger preserved examples these lines more or less obsolete or absent.

The Academy has 1 Pacific Ocean, 20 from Honolulu through B. Sharp, 7 Hawaiian, 4 Apia and 20 from Tahiti through Andrew Garrett. Length 52 to 275 mm. In the National Museum 1 from Oahu, 3 Fiji, and 8 without locality, though likely Hawaiian, all obtained by the Wilkes Expedition. Also a series from Oahu through T. H. Streets, a large series of Hawaiian specimens, with some from Hanalei River, 3 Waiamea River, 6 Apia, 2 Bonin Islands through William Stimpson. The Bishop Museum has 29 from Honolulu, 26 from Laie Stream on Oahu taken November 5, 1922, by C. Montague Cooke, II and III, 1 Hilo December 13, 1902, by H. W. Henshaw, 1 Honomuni on Molokai June 19, 1914, by W. A. Bryan, 4 Guam, 2 Tubuai, 1 Nukuhiva, 1 Tahiti. Largest 228 mm. I found 560 specimens in the Honolulu markets during November and December, 1922. Also 7 from Guam in 1923 and 1 from Palmyra Island in 1913. In the Agassiz Museum 19 Hawaiian specimens, of which 2 through Andrew Garrett, 39 Society Islands also through Andrew Garrett, 3 Kusaie in the Carolines through Rev. B. G. Snow, 4 Apia.

Jordan and Evermann give 70 to 80 scales for *Eleotris sandwicensis* Vaillant and Sauvage, and admit it as a distinct species. *Eleotris fusca* is alleged to differ in having but 52 scales. Now

the Hawaiian fish had been identified with *Poecilia fusca* Schneider by all previous writers and with all the evidence correctly so. I have abundant materials for comparison, specimens ranging from 48 mm. upward. It is indeed difficult to see how they could give 70 to 80 scales for the Hawaiian fish, when not one of mine shows over 65, even according to their method of counting. Surely some of the scales on the head must have been included. I therefore accept but one species in Oceania. Jouan describes a specimen as *Eleotris,* 120 mm. long, from Kanala (Soc. Cherbourg, Mem., vol. 9, p. 109, 1863).

Zanzibar, Madagascar, Bourbon, Mauritius, Seychelles, India, Ceylon, Nicobars, Andamans, East Indies, China, Riu Kiu, Japan, Queensland, Melanesia, Micronesia, Polynesia, Hawaii.

Eleotris melanosoma Bleeker.

Eleotris melanosoma Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 705, 1852 (type loc, Wahai, Ceram; West Sumatra).—Weber: Nova Guinea, vol. 9, pt. 4, p. 597, 1913 (Faté River?, Humboldt Bay).—Weber and Beaufort: Nova Caledonia (Sarasin and Roux), Zool., vol. 2, pt. 1, p. 33, 1915 (Oubatche).

Eleotris (Culius) melanosoma Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 136, 1913 (Waiha River, Waiu Waigé River, Waigiu).

Head 4 in total; depth 6 to 7; D. VI-I, 8; A. I, 8; scales 52. Eye 4 1/2 to 5 1/2 in head, 1 2/3 in interorbital. Mandible protrudes. Maxillary to below eye center. Teeth in villiform bands. Preopercle with spine directed downwards. Scales on head above small, extend over forehead; cheeks naked. Blackish-green, fins variegated with black. (Günther)

East Indies. Reaches 115 mm.

Eleotris macrocephalus (Bleeker).

Culius macrocephalus Bleeker: Nat. Tijds. Ned. Ind., vol. 13, p. 70, 1857 (type loc., Kajeli).

Eleotris macrocephalus Weber: Nova Guinea, vol. 9, pt. 4, p. 597, 1913 (Humboldt Bay and Mbai River).—Weber and Beaufort: Nova Caledonia (Sarasin and Roux), Zool., vol. 2, pt. 1, p. 33, 1915 (La Foa).

According to Bleeker agrees with *Eleotris melanosoma* in the presence of 14 or 15 transverse series of scales, and 50 to 55 in median lateral series. Said to differ in the head 3 1/4 to 3 3/4 in total. Reaches 105 mm.

East Indies, Melanesia.

Eleotris macrolepis (Bleeker).

Culius macrolepis Bleeker: Arch. Neerl. Sci. Nat. Haarlem, vol. 10, p. 109, 1875 (type loc., Amboina).

Eleotris (Culius) macrolepis Weber: Nova Guinea, vol. 5, pt. 2, p. 257, 1908 (Klipong River, north New Guinea).

Eleotris macrolepis Weber: Nova Guinea, vol. 9, pt. 4, p. 597, 1913 (Humboldt Bay).

With the large head of *Eleotris macrocephalus,* lateral scales 42 to 45 but transverse scales 11 or 12. Reaches 81 mm. according to Bleeker.

East Indies.

Eleotris herwerdenii Weber.

Eleotris herwerdenii Weber: Leyden Mus., Notes, vol. 32, pt. 4, p. 238, 1910 (type loc., Lorentz River, New Guinea).—Hase: Jena. Zeitsch. Nat., vol. 51, p. 537, 1914 (Tami, Kaiser-Wilhelms Land, New Guinea).

Eleotris herwerdeni Weber: Nova Guinea, vol. 9, pt. 4, p. 594, pl. 13, fig. 2, pl. 14, fig. 2, 1913 (Varen River and Lorentz River).

Head 2 7/10 to 2 4/5; depth 5 to 5 1/5; D. VI-I, 9; A. 18; scales 62 to 70, 22 transversely; eye 6 to 7 in head. Upper profile slightly convex to dorsal, somewhat concave between eyes. Mandible protrudes. Maxillary to eye center. Scales ctenoid, 35 to 40 predorsal to hind eye edge. First dorsal double postorbital length, third spine longest or little over half of head. Caudal rounded. Pectoral equals postorbital, ventral shorter. Dark brown, below yellowish with dark lines on scale rows. Dark band from snout through eye to caudal base. Fins clear, dorsal with dark streaks. Length 200 mm. (Weber)

Eleotris fimbriatus Weber.

Eleotris fimbriatus Weber: Nova Guinea, vol. 5, pt. 2, p. 254, 1908 (type loc., Etna Bay, southwest New Guinea).—Weber: op. cit., vol. 9, pt. 4, p. 594, pl. 13, fig. 1, 1913 (Sabang, Lorentz River, Alkmaar).

Eleotris fimbriata Regan: Trans. Zool. Soc. London, vol. 20, pt. 6, p. 276, 1914 (Mimika River).

Head 3 to 3 1/4; depth 5; D. VI-13; A. 11; scales 60 to 62, transversely 20 or 21; eye 4 1/2 in head, long as obtuse snout or interorbital. Mouth oblique, reaches eye. Upper lip shaggy. Fine teeth in narrow bands, below detached in median and posterior series and conically enlarged; palate toothless. Scales ctenoid, predorsal cycloid and extend before eye. Spinous dorsal with tips of spines filamentous. Second dorsal 2/3 body depth, high as first dorsal and anal. Pectoral equals head without snout. Yellowish-gray, below lighter. Second dorsal and caudal with rows of dots. Three dark lines from below eye to opercle. Before eye dark triangular blotch. Dark ocellus at caudal base. Length 80 mm. (Weber)

Gobiomorphus eugenius (Jordan and Evermann).

Quisquilius eugenius Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 203, 1902 (1903) (type loc., Waikiki, Honolulu, Oahu).—Snyder: op. cit., vol. 22, p. 536, 1902 (1904) (Laysan Island).—Jordan and Evermann: op. cit., vol. 23, pt. 1, pl. 57, 1903 (1905).—Jordan and Snyder: (U. S.) Bur. Fish., Bull., vol. 26, p. 217, 1906 (1907) (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 77, Dec., 1922 (Hawaii).

Gobiomorphus eugenius Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 483, 1903 (1905) (Honolulu; Waikiki).

Head 3; depth 3 2/3; D. VI, 12; A. I, 9; scales 25, 12 transversely; snout 4 4/5 from snout tip; eye 3 1/8. Head width 1 1/4 its length. Mouth large, mandible protruded. Maxillary reaches below front of eye. Teeth biserial, outer larger, inner depressible. Tongue truncate. Interorbital 2 in eye, very deeply furrowed. Side of head scaly and with several rows of papillae. Third dorsal spine 1 4/5 in total head length; first ray 2 1/5; fourth anal ray 2; caudal 1 1/5; caudal peduncle depth 2 2/5; pectoral 1; ventral 1 1/8. Brown, with 10 dark brown transverse bands, edges of scales within their areas lighter. Dorsal, anal and caudal dark brown, edged in part white. Pectoral light reddish-brown. Length 32 mm. (Jordan and Evermann)

Pogoneleotris microps Weber.

Pogoneleotris microps Weber: Nova Guinea, vol. 5, pt. 2, p. 258, pl. 12, figs. 4a-b, 1908 (type loc., Tawarin River, north New Guinea; Merauke River, south New Guinea).—Weber: op. cit., vol. 9, pt. 4, p. 598, pl. 14, figs. 14a-c, 1913 (Lorentz River and Varen River).

Head 3 1/3; depth 3 1/2; D. VI-I, 8; A. I, 8; scales 32 to 34, 10 transversely. Upper profile of head concave above eye. Back elevated. Eye 11 in head from snout tip, 2 1/4 in snout, 4 2/5 in interorbital. Mouth

cleft little inclined, mandible slightly protruding. Upper jaw nearly reaches eye center. Teeth fine, in broad bands, inner row little larger. Scales ctenoid, basally each with 5 small ctenoid scales; smaller on head, breast and pectoral base. Third dorsal spine 2 3/4 in total head length; third branched ray 2 1/10; third anal ray 1 7/8; caudal 1, rounded; least depth of caudal peduncle 2 1/2; pectoral 1 1/8; ventral 1 1/4. Light or dark brown, with diffuse darker longitudinal streaks or marblings. First dorsal with several yellowish band-like blotches. Other fins, except ventral, with dark spots or blotches. Length 230 mm. (Weber)

Butis butis (Buchanan-Hamilton).

Cheilodipterus butis Buchanan-Hamilton: Fishes of Ganges, pp. 57, 367, 1822 (type loc., Ganges River below Calcutta).

Eleotris butis Ramsay and Ogilby: Linn. Soc. New South Wales, Proc., ser. 2, vol. 1, p. 81, 1886 (Strickland River, New Guinea).—Weber: Nova Guinea, vol. 9, pt. 4, p. 597, 1913 (Lorentz River and Humboldt Bay).

Eleotris (Butis) butis Beaufort: Bijdr. Dierk. Amsterdam, vol. 19, p. 136, 1913 (Waiu Waigé River, Waigiu).

Head 3 to 3 1/3 in total; depth 5 1/3 to 5 1/2; D. VI-I, 8; A. I, 8; scales 28, transversely 9 or 10. Head broad, depressed anteriorly, profile rather concave from snout to occiput, width little over half length. Eye 5 to 6 in head, 1 3/4 in snout, 1 3/4 in interorbital. Mandible protrudes. Mouth cleft begins opposite upper eye edge. Maxillary reaches middle of eye. Teeth in uniformly fine villiform bands. Finely serrated ridge along posterior and superior edges of orbit, from which divided by 2 rows of fine scales; serrated ridge also either side of mouth; serrations all variable, mostly distinct in young. Scales ctenoid on body, with age 5 or more rudimentary basal to each large one; cover head except front of snout and its under surface; 25 predorsal. First dorsal lower than second. Caudal truncate. Pectoral long as head without snout. Ventral reaches half way to anal.

Generally leaden or brownish, sometimes blotched darker. First dorsal nearly black. Second dorsal, anal and caudal yellowish, with bands of spots, and upper caudal edge sometimes reddish. Scarlet spot at pectoral base, divided medially by round black mark. Length 102 mm. (Day)

India, East Indies, China, Philippines.

Butis amboinensis (Bleeker).

Eleotris amboinensis Bleeker: Nat. Tijds. Ned. Ind., vol. 5, p. 343, 1853 (type loc., rivers of Amboina).—Weber: Nova Guinea, vol. 5, pt. 2, p. 253, 1908 (Klipong River, north New Guinea).—Weber: op. cit., vol. 9, pt. 4, p. 598, 1913 (Mbai River).

Butis amboinensis McCulloch and Ogilby: Australian Mus., Records, vol. 13, p. 271, pl. 36, fig. 4, 1919 (Strickland River, Papua; Ugi, Solomons).

Differs from *Butis butis* in the shorter maxillary (reaches front border of eye) and outer row of teeth in each jaw enlarged. Reaches 153 mm. according to McCulloch and Ogilby.

India, Andamans, East Indies, Queensland, Melanesia.

Asterropterix semipunctatus Rüppell.

Asterropterix semipunctatus Rüppell: Atlas Reise Nord. Afrika, Fische, p. 138, pl. 34, fig. 4, 1828 (type loc., Massaua, Red Sea).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 385, pl. 36, fig. 1, 1905 (1906) (Apia; Pago Pago).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 317, 1911 (Fakarava, Paumotus).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 26, 1925 (Pearl and Hermes Reef).—Whitley: Australian Mus., Records, vol. 27, no. 1, p. 27, 1927 (Suva, Fiji).

Asterropteryx semipunctatus Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, p. 329, 1868 (Samoa).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 500, 1902 (1903) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 480, 1903 (1905) (Waianae; Waikiki; Honolulu; Samoa).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 77, Dec. 1922 (Honolulu).

Eleotris semipunctata Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 187, pl. 111, fig. D, 1877 (Samoa; Society Islands; Pelew Islands).

Brachyeleotris cyanostigma Streets: U. S. Nat. Mus., Bull., no. 7, pp. 58, 95, 1877 (Oahu coral reef; Samoa).

Asterropteryx cyanostigma Snyder: U. S. Fish Comm., Bull., vol. 22, p. 536, 1902 (1904) (Honolulu).

Eleotris miniatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 125, 1900 (type loc., Guam).

Head 3 1/10; depth 3 1/10; D. VI-1, 7, 1; third spine elongated to caudal base; A. 1, 9, 1; scales 24 in median lateral series to caudal base and 2 more on latter; 9 scales transversely; 6 predorsal scales; snout 4 in head; eye 3 7/8; maxillary 3; interorbital 2 3/4. Scales with 7 or 8 basal radiating striae and 1 to 3 auxiliaries; 11 or 12 curved marginal striae above and below; apical denticles 22 to 26 + 25 to 28.

One in the Academy, obtained at Kewalo Beach near Honolulu in 1913 by H. A. Pilsbry. In the National Museum 1 from Maui obtained by the Wilkes Expedition. Also 6 Samoan specimens through the Bureau of Fisheries and 2 from Steinberger, 2 from Honolulu through T. H. Streets, 14 Hawaiian specimens, of which 6 through Henderson and Bartsch, and 1 from Fakarava. The Bishop Museum has 1 from Honolulu, 3 from Waikiki on Oahu in 1922 through C. H. Edmondson, 4 from Honomuni on Molokai in July, 1914, through W. A. Bryan, 1 from Pearl City on Oahu in 1918 through J. W. Thompson, 2 from Palmyra Island in 1913 through C. Montague Cooke, Jr., and 4 types of *Eleotris miniatus*. Length 23 to 45 mm. Also 1 from Pearl and Hermes Reef in 1923.

Red Sea, Seychelles, Cocos-Keeling, Polynesia. Micronesia, Hawaii.

Asterropterix modestus Bleeker.

Asterropteryx modestus Bleeker: Arch. Neerl. Sci. Nat. Haarlem, vol. 10, p. 111, 1875 (type loc., Singapore; Benculen, Sumatra) (on *Eleotris cyprinoides*, non Valenciennes, Günther).

Eleotris (Asterropteryx) modestus Perugia: Mus. Genova, Ann., vol. 34, p. 548, 1894 (Inawi, River San Guiseppe, district of Makeo, New Guinea).

According to Bleeker would differ in D. VI-1, 9 or 10, scales 28 and head and body without spots or bands. Reaches 62 mm.

East Indies.

Eviota afelei Jordan and Seale.

Eviota afelei Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 387, fig. 77, 1905 (1906) (type loc., Pago Pago).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 125, 1922 (Pago Pago).

Head 3 to 3 3/5; depth 4 to 4 1/4; D. VI-1, 9; A. 1, 8; scales 22 in median lateral series to caudal base and 2 more on latter; 8 scales transversely; snout 4 in head; eye 3 to 3 1/5; maxillary 2 1/3; interorbital

1 2/3 to 1 3/5 in eye. Scales with 11 to 13 basal radiating striae; apical denticles 24 to 26; circuli moderate. Most with caudal marked with more or less distinct blackish median basal blotches.

In the Academy 6 specimens from Pago Pago, 14 to 17 mm. long.

Eviota distigma Jordan and Seale.

Eviota distigma Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 389, fig. 79, 1905 (1906) (type loc., Pago Pago).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 125, 1922 (Pago Pago).

Head 2 4/5 to 3; depth 3 1/2 to 4 1/5; D. VI-9; A. 8 or 9; scales 20 in median lateral series to caudal base and 2 more on latter; 7 scales transversely; snout 4 to 4 1/4 in head; eye 2 2/3 to 2 7/8; maxillary 2 1/2 to 2 3/4; interorbital 2 in eye. Scales with 7 or 8 basal striae; apical denticles 15 to 20; circuli moderate. Similar color-pattern to *Eviota zonura*, differing only in the presence of 2 round black spots at pectoral base. Front dorsal spines, in at least one specimen, slightly filamentous and elongated.

Three in the Academy from Pago Pago, 14 to 16 mm.

Eviota herrei Jordan and Seale.

Eviota herrei Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 390, fig. 81, 1905 (1906) (type loc., Apia; Pago Pago).

According to Jordan and Seale closely resembles *Eviota distigma* but differs in the larger mouth and usually but one dark spot at pectoral base. Length 20 mm.

Eviota epiphanes Jenkins.

Eviota epiphanes Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 501, fig. 42, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 481, fig. 211, 1903 (1905) (Honolulu; Waikiki).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 30, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 26, 1925 (Ocean and Laysan islands).—Fowler: op. cit., Bull. 38, p. 27, 1927 (Tongareva).

Eviota smaragdus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 388, fig. 78, 1905 (1906) (type loc., Pago Pago).

Eviota sebreei Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 390, fig. 80, 1905 (1906) (type loc., Apia).

Eviota pruinosa Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 391, fig. 82, 1905 (1906) (type loc., Pago Pago).

Eviota gymnocephalus Weber: Siboga Exped., vol. 65, p. 452, fig. 87, 1913 (type loc., Muaras Reef; Kabala dua; Sanguisiapo; Kwandang Bai; Siau; Karkaralong Islands; Lirung; Waigieu; Sanana; Saleyer; Timor).

Head 3 1/5 to 3 1/3; depth 4 2/5 to 5; D. VI-1, 8 or 9; A. 1, 8 or 9; scales 24 to 28 in median lateral series; 7 scales transversely; snout 4 to 4 1/2 in head; eye 3; maxillary 2 1/5 to 2 2/5. Scales with 11 to 13 basal radiating striae; apical denticles 24 or 25; circuli moderate.

In the Academy 5 from the Hawaiian islands, 7 to 12 mm. long. The Bishop Museum has 5 from Honolulu, 1 from Pearl City on Oahu taken October 8, 1922, by J. W. Thompson, and 13 from Waikiki through C. H. Edmondson in 1922. Two from Ocean Island and 4 Laysan, also 12 from Tongareva, in 1923. In the National Museum the type and 5 specimens from Honolulu.

Eviota smaragdus, based on specimens a little larger (25 mm.) from Samoa, may be a later stage. *Eviota sebreei* (18 mm.) and *Eviota pruinosa* (23 mm.) may be other variations. *Eviota gymnocephalus* (12 to 25 mm.) may also be the same.

East Indies, Polynesia, Hawaii.

Eviota viridis (Waite).

Allogobius viridis Waite: Australian Mus., Records, vol. 5, p. 177, pl. 23, fig. 3, 1904 (type loc., Lord Howe Island).

Eviota viridis Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 26, 1925 (French Frigates Shoal, Laysan, Ocean, Johnston, Wake islands).—Fowler: B. P. Bishop Mus., Bull. 38, p. 27, 1927 (Oahu, Howland, Christmas, Tongareva, Canton islands).

Eviota zonura Jordan and Seale: (U. S. Bur. Fish., Bull., vol. 25, p. 386, fig. 75, 1905 (1906) (type loc., Apia; Pago Pago).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 317, 1911 (Fakarava, Rangiroa and Makemo, Paumotus).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 124, 1922 (Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 22, p. 35, 1925 (Samoa).

Head 2 7/8 to 3 1/8; depth 3 1/4 to 4; D. VI-10; A. 9; scales 25 in median lateral series to caudal base and 3 more on latter; 7 scales transversely; snout 5 to 6 in head; eye 2 3/4 to 3; maxillary 2 1/3 to 2 1/2; interorbital 1 1/2 in eye. Scales with 11 to 13 basal striae; apical denticles 20 to 22, uniform; circuli large.

Color in alcohol with 7 transverse dark vertical bands, though only distinct on back above and along lower edge of trunk behind vent, pale in median areas. Last more distinct than others medianly, or as blackish blotch at caudal base. Dorsals and anals both quite dusky. Small dusky spot just above opercle.

In the Academy 2 from Pago Pago, 14 to 16 mm. long. The Bishop Museum has 10 from Palmyra Island obtained by C. Montague Cooke, Jr., in 1913. Largest 20 mm. Also 5 from French Frigates Shoal, 4 Laysan, 2 Ocean Island, 3 Johnston Island and 8 Wake Island in 1923. In 1924 from Howland Island 51, Christmas Island 1, Tongareva 3, Canton Island 2. Also 3 from Oahu in 1925 do not differ. In the National Museum 2 from Rangiroa and 1 from Makemo. In the Agassiz Museum 2 from lagoon on Fakarava.

Queensland, Lord Howe Island, Polynesia.

Eviota prasites Jordan and Seale.

Eviota prasites Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 387, fig. 76, 1905 (1906) (type loc., Pago Pago).

Distinguished by the first 4 dorsal spines elongated, fully connected by membrane, half as long as combined head and body. Yellowish-white. Blackish blotch at infero-median caudal rays. Length 25 mm. (Jordan and Seale)

Eviota caesiura (Jordan and Seale).

Trimma caesiura Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 391, fig. 83, 1905 (1906) (type loc., Apia).

Eviota caesiura Fowler: B. P. Bishop Mus., Bull. 38, p. 27, 1927 (Tongareva).

Head 3 1/5; depth 4 1/2; D. VI-8; A. 9; scales 25, 8 transversely; snout 4 in head from snout tip; eye 3; interorbital 2 in eye. Mandible protruded. Maxil-

lary greatly inclined, nearly reaches below front eye edge. Several rows of small sharp teeth in jaws. Predorsal scaled, with about 6 scales. Second dorsal spine 1 3/5 in total head length; third ray 1 2/3; fifth anal ray 1 4/5; caudal peduncle depth 2 1/2; caudal 1 1/4, rounded; pectoral 1 1/5; ventral 1 1/10. Plain bright red, with gray spot on back of tail and gray spot on many scales of back and head. Fins all bright red. Length 32 mm. (Jordan and Seale)

Hypseleotris cyprinoides (Valenciennes).

Eleotris cyprinoides Valenciennes: Hist. nat. Poiss., vol. 12, p. 187, 1837 (type loc., Saint Maurice River, Bourbon Island).—Günther: Cat. fishes Brit. Mus., vol. 3, p. 118, 1861 (Oualan).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 19, 1869 (Kanathia).—Schmeltz: op. cit., Cat. 5, p. 28, 1874 (Viti; Samoa).

Crassiops cyprinoides Fowler: B. P. Bishop Mus., Bull. 22, p. 35, 1925 (Samoa).

Eleotris oxycephala (non Schlegel) Schmeltz: Mus. Godeffroy, Cat. 4, p. 18, 1869 (Samoa).

Asterropteryx güntheri Bleeker: Arch. Neerl. Sci. Nat. Haarlem, vol. 10, p. 112, 1875 (type loc., Oualan).

Eleotris guentheri Günther: Mus. Godeffroy. Jour., vol. 6, pt. 11, p. 186, pl. 113, fig. A, 1877 (Oualan; Fiji; Samoa; Savaii).

Eleotris guntheri Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1406, 1906 (fresh waters of Samoa).

Crassiops guentheri Ogilby: Linn. Soc. New South Wales, Proc., vol. 22, pp. 769, 785, 1897 (New Caledonia).

Crassiops cyprinoides var. *güntheri* Weber and Beaufort: Nova Caledonia (Sarasin and Roux), Zool., vol. 2, pt. 1, p. 35, 1915 (Tchalabel; streams near Cape Colnett).

Hypseleotris guntheri Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 385, fig. 74, 1905 (1906) (Vaisigano; Gaségase; Vailima; Apia).

Eleotris (Giuris) vanicolensis Sauvage: Soc. Philom. Paris, Bull., 7th ser., vol. 4, p. 54, 1880 (type loc., Vanicolo).

Eleotris nigra (Quoy and Gaimard) Sauvage: Soc. Philom. Paris, Bull., 7th ser., vol. 4, p. 54, 1880 (name in text).

Head 3 1/3 to 3 3/5; depth 3 4/5 to 4 3/4; D. VI-1, 8, 1; A. 1, 10 or 11; scales 25 to 30 in median lateral series to caudal base and 3 more on latter; 8 or 9 scales transversely; 14 to 17 predorsal scales; snout 4 to 4 1/5 in head measured from upper jaw tip; eye 3 2/3 to 4 1/8; maxillary 4 1/8; interorbital 2 4/5 to 3 1/3. Scales with 11 to 17 basal striae; apical denticles 65 to 72; circuli moderate.

In the Academy 17 from Apia 55 to 83 mm. Series in the National Museum from Apia. Also series in the Agassiz Museum from Apia.

There is little doubt but that *Eleotris (Giuris) vanicolensis* Sauvage is a synonym. It is based on a specimen 100 mm. A handsome little fish, suggestive of cyprinodonts. Well figured by Jordan and Seale.

Bourbon, East Indies, Melanesia, Micronesia, Polynesia.

Hypseleotris godeffroyi (Günther).

Eleotris godeffroyi Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 188, pl. 122, fig. B, 1877 (type loc., Raiatea; Society Islands).

Head 2 4/5 to 2 7/8; depth 4 to 4 1/4; D. VI-I, 6, 1; A. I, 6; scales 20 or 21 in median lateral series to caudal base and 3 more on latter; 7 or 8 scales transversely; 7 to 9 predorsal scales; snout 4 1/4 to 4 3/4 in head measured from upper jaw tip; eye 3 3/4 to 4; maxillary 3 1/4 to 3 1/3; interorbital 3 1/3 to 3 3/4.

Body depressed forward, trunk compressed, deepest at soft dorsal origin. Caudal peduncle strongly compressed, least depth 1 2/5 to 1 1/2 in its length or 2 1/8 to 2 1/5 in total head length.

Head width 1 2/5 to 1 4/5 in its total length. Snout depressed, pointed in profile, with upper surface flattened, length half its width. Eye advanced, center at first third in head; diameter greater than snout length or interorbital. Mouth oblique, lower jaw protruding Teeth in jaws fine, slender, uniserial. Tongue slender, broadly convex in front. Nostril in short tube at last 2/5 in snout. Interorbital level.

Gill rakers 2 + 7, lanceolate, 2 in gill filaments and 2 in eye.

Scales with 15 to 21 basal radiating striae; apical denticles 20 to 25 + 20 to 25; circuli fine.

Third dorsal spine 1 1/3 to 1 2/5 in head; fifth dorsal ray 1 to 1 1/3; fourth anal ray 1 1/8; caudal 1 1/5; pectoral 1 1/3 to 1 3/4; ventral 1 1/8 to 1 1/3.

Pale brown generally, with 6 broad dusky-brown transverse bands on trunk and tail; first at hind part of opercle; second from front of spinous dorsal; third from close behind spinous dorsal; fourth from front of soft dorsal to that of anal; fifth close behind soft dorsal and anal; sixth widest and on middle of caudal peduncle. Dorsals and caudal all more or less dusky. Pectoral and ventral pale brown. Iris silvery. Length 28 to 34 mm.

In the Agassiz Museum 3 from the Society Islands, obtained by Andrew Garrett.

Hetereleotris diadematus (Rüppell).

Gobius diadematus Rüppell: Atlas Reise Nord. Afrika, Fische, p. 137, 1828 (type loc., Red Sea).

Hetereleotris diadematus Fowler: B. P. Bishop Mus., Bull. 38, p. 27, 1927 (Suva Bay, Fiji).

Hetereleotris clara Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 392, pl. 36, fig. 2, 1905 (1906) (type loc., Pago Pago, Samoa).

Hetereleotris phaenna Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 393, pl. 36, fig. 3, 1905 (1906) (type loc., Pago Pago).

Head 3 3/4; depth 6 1/4; D. VI, 13; A. I, 11; snout 5 from snout tip; eye 4 1/2. Mouth large, mandible protruded. Maxillary oblique, reaches eye. Small teeth in jaws and on palatines. No scales. Third dorsal spine 3 in total head length, fourth ray 2 1/8; third anal ray 2 1/2; caudal peduncle depth 2 7/8; caudal 1 3/4; pectoral 1 1/2; ventral 1 3/5. Creamy white, thickly dotted with dark brown points. Each side with broad black-brown band from snout tip to caudal. Below white. Small examples black below, white above. Length 25 mm. (Jordan and Seale)

Gobius diadematus is based on a specimen 38 mm. The nominal *Hetereleotris clara* and *Hetereleotris phaenna* appear to me to be simply younger stages; *H. clara*, 25 mm.; *H. phaenna*, 19 mm. Two in the Bishop Museum from Suva, Fiji.

Red Sea, Polynesia.

Valenciennea strigatus (Broussonet).

Gobius strigatus Broussonet: Ichth., no pagination, pl., 1782 (type loc., near Tahiti).—Bonnaterre: Tableau ichth., p. 64, pl. 35, fig. 138, 1788 (Pacific Ocean).—Gmelin: Systema nat., p. 1204, 1788 (copied).—Walbaum: Artedi Piscium, pt. 3, p. 202, 1792 (copied).

Eleotris strigata Schneider: Systema ichth., Bloch, p. 65, 1801 (copied).—Valenciennes: Hist. nat. Poiss.,

vol. 13, p. 189, 1837 (Tahiti).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 19, 1869 (Samoa; Viti Islands).—Günther: Mus. Godeffroy, Jour., vol. 6. pt. 11, p. 190, pl. 111, fig. E, 1877 (Fiji; Samoa; Society Islands).

Valenciennea strigata McCulloch and Ogilby: Australian Mus., Records, vol. 13, p. 261, 1919 (New Hebrides).

Head 3 3/5; depth 4 2/5; D. VI, I, 18, 1; A. I, 17, 1; scales 120 in median lateral series to caudal base and 10 more out over latter; 40 scales transversely between soft dorsal and anal origins; 26 predorsal scales; snout 3 in head; eye 5 1/4; maxillary 2 3/5; interorbital 4 1/8.

Body elongate, compressed, deepest at soft dorsal origin. Caudal peduncle well compressed, length slightly less than least depth, which 2 1/8 in head.

Head width 2 1/8 in its length. Snout conic, rather obtuse, length 7/8 its width. Eye high, with hind edges midway in head length; diameter 1 3/4 in snout, 1 1/3 in interorbital. Mouth large, jaws subequal. Maxillary reaches eye. Lips firm, fleshy, lower much broader. Teeth conic, well spaced, uniserial in jaws and each side below little advanced posteriorly directed canine; no teeth on palate. Tongue rounded, entire. Nostrils rather small; front nostril about midway in snout; hind nostril little closer to anterior than to eye. Interorbital little convex.

Gill rakers 7 short, feeble, flexible points on lower half of first arch, half of gill filaments, which 1 1/3 in eye. Head and narrow median predorsal strip naked. Caudal base, breast and chest finely scaled. Scales with 5 to 11 basal radiating striae; apical denticles 16 to 24; circuli very fine. Dorsal spines end in filaments, second 2 3/4 in combined head and trunk; third dorsal ray 2 1/5 in head; third anal ray 2 1/8; caudal 1 1/10, rounded behind; pectoral 1 2/5; ventral 1 1/2.

Uniform dull brownish generally, under surface of head and belly pale. Gray line from near end of maxillary, bordered by dark line, extends to upper angle of opercle behind. Fins all pale brownish. Length 140 mm.

In the Agassiz Museum 1 from the Society Islands obtained by Andrew Garrett.

Distinguished from *Valenciennea violifera* by the increased dorsal rays and the uniform body.

East Indies, Melanesia, Polynesia.

Valenciennea violifera Jordan and Seale.

Valenciennea violifera Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 383, pl. 52, fig. 2, 1905 (1906) (type loc., Pago Pago; Apia).—McCulloch and Ogilby: Australian Mus., Records, vol. 13, p. 261, 1919 (Samoa; New Hebrides; Bougainville Island; Duke of York Island).

Agrees with the following species in having 12 branched rays in the second dorsal. Also like *Valenciennea muralis* with the third dorsal spine longest and crossbands and ocelli indefinite or absent. From the same it differs in having 9 large ocelli on cheek and opercle.

Melanesia, Polynesia.

Valenciennea muralis (Valenciennes).

Eleotris muralis (Quoy and Gaimard) Valenciennes: Hist. nat. Poiss., vol. 12, p. 190, pl. 357, 1837 (type loc., Tukopia, Taiboa Group).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 29, 1874 (Viti; Rarotonga).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 189, 1877 (Fiji; Pelew Islands).—Sauvage: Soc. Philom. Paris, Bull., 7th ser., vol. 6, p. 172, 1882 (New Caledonia).

Gobius muralis Schmeltz: Mus. Godeffroy, Cat. 6, p. 14, 1877 (Pelew Islands).

Eleotris lineato-oculatus Kner: Akad. Wiss. Wien, Sitz., vol. 56, p. 720, pl. 3, fig. 1, 1867 (type loc., Viti Islands).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 28, 1874 (Viti Islands).

Head 3 to 3 1/5; depth 5 to 5 1/3; D. VI-I, 12, 1; A. I, 12, 1; scales 78 to 80 in median lateral series to caudal base and 7 more on latter; 30 scales transversely at soft dorsal and anal origins; snout 2 1/2 to 2 3/4 in head; eye 4 to 4 1/8; maxillary 2 2/5 to 2 3/5; interorbital 6 1/2 to 8.

Body elongate, compressed. Caudal peduncle well compressed, least depth 1 1/6 to 1 1/5 in its length or 2 3/4 to 3 in head.

Head width 1 4/5 in its length. Snout convex over surface, width 1 to 1 1/6 in its length. Eye superolateral, hind pupil edge midway in head; diameter 1 1/2 to 1 3/4 in snout. Mouth moderate, lower jaw slightly shorter. Maxillary reaches front eye edge, not quite to front pupil edge. Lips rather broad. Upper teeth uniserial, anteriorly slightly larger and curved in jaw; mandibular teeth biserial, outer series ending in slight antero-lateral canine. Tongue with front edge broadly convex, not notched. Nostrils small, rather close together, front one at last 2/5 in snout. Interorbital level.

Gill rakers 1 + 7, lanceolate, 1 1/4 in gill filaments, which 1 4/5 in eye.

Scales with 10 or 11 basal radiating striae; apical denticles 7 or 8 + 7 or 8; circuli fine. Head naked, occipital scales not extending to eyes. Fourth dorsal spine 1 1/5 to 1 4/5 in head, ends in filament; twelfth dorsal ray 1 3/5 to 2 1/4; twelfth anal ray 1 3/5 to 2 2/5; pectoral 1 1/4 to 1 1/3; ventral 1 3/4 to 1 4/5; caudal ends in long median point, 2 7/8 to 3 1/4 in combined head and trunk.

Brownish generally, slightly paler on under surface of head and belly. Four longitudinal pale streaks or narrow bands; first begins on nape and reaches to last dorsal ray; second starts from snout through eye and fades below last dorsal rays; third begins above hind edge of maxillary and reaches caudal base; fourth ventral along sides of trunk. Spinous dorsal with 7 horizontal dark edged narrow bands and large black blotch behind end of third spine. Other fins all pale brownish. Length 75 to 83 mm.

In the Agassiz Museum 3 from the Pelew Islands, obtained by R. Torrey in 1862.

Differs from *Valenciennea violifera* in the banded cheek, not spotted.

India, East Indies, Japan, Queensland, Melanesia, Micronesia, Polynesia.

Valenciennea longipinnis (Lay and Bennett).

Eleotris longipinnis Lay and Bennett: Zool. Beechey's voyage, p. 64, pl. 20, fig. 3, 1839 (type loc., Loo Choo Islands).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 190, 1877 (Fiji).—Günther: Rept. voyage "Challenger," vol. 1, p. 35, 1880 (Ovalau, Fiji).

Eleotris strigata (non Broussonet) Thiollière: Fauna Woodlark, p. 188, 1857 (Woodlark Island).

Eleotris ikeincur (Montrouzier) Thiollière: Fauna Woodlark, p. 188, 1857 (name in synonymy).

Third dorsal spine subequal with others. Five crossbands on trunk, forming distinct large ocelli on sides. Reaches 125 mm. according to Bleeker.

East Indies, Riu Kiu, Queensland, Melanesia, Polynesia.

GOBIIDAE

The species *Parachaeturichthys hinsbyi* (Johnston) McCulloch and Ogilby (Australian Mus., Records, vol. 12, no. 10, p. 215, pl. 33, fig. 1, 1919) has been reported as *Gobius pictus*

Schmeltz (Mus. Godeffroy, Cat. 4, p. 18, 1869, name only) from the Pelew Islands.

Gobiodon verticalis Alleyne and Macleay.

Gobiodon verticalis Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 333, pl. 12, fig. 4, 1877 (type loc., New Guinea).

Gobiodon axillaris De Vis: Linn. Soc. New South Wales, Proc., vol. 8, p. 448, 1883 (type loc., Bank's Group).

Gobiodon atrangulatus Garman: Mus. Comp., Zool., Bull., vol. 39, p. 234, pl. 2, fig. 2, 1903 (type loc., Nairai, Fiji).—Kendall and Goldsborough: Mus. Comp Zool., Mem., vol. 26, p. 322, 1911 (Fakarava, Paumotus).

Head 3 1/2 to 3 3/5; depth 2 1/5; D. VI, 11 or 12; A. 10 or 11; eye 4 3/5 to 4 4/5, equals interorbital. Head much deeper than long, greatly compressed. Maxillary to front or middle of eye. Narrow band of teeth in jaw, outer row strong and others villiform; large curved canine each side of mandible. No scales. Dorsal spines subequal or fifth longest, spinous fin rounded. Green or scarlet, usually with 4 broad dark bars on head and 1 at pectoral base, sometimes absent. Sometimes about 5 irregular undulating longitudinal stripes on body. Sometimes dark spot may be present on upper edge of gill opening. Length 47 mm. (McCulloch and Ogilby)

The type *Gobiodon atrangulatus* in the Agassiz Museum and 2 specimens from Fakarava. The National Museum has 3 specimens from Fakarava.

Gobiodon axillaris De Vis is described with head deeper than long, 4 brown vertical lines on head and blackish-red spot above the pectoral axil.

Queensland, Melanesia, Polynesia.

Gobiodon rivulatus (Rüppell).

Gobius rivulatus Rüppell: Atlas Reise Nord. Afrika, Fische, p. 136, 1828 (type loc., Jubal Island, Red Sea).

Gobiodon rivulatus Peters: Akad. Wiss. Berlin, Monatsb., p. 840, 1876 (New Britain).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 180, pl. 109, figs. F-G, 1877 (Society Islands; Friendly Islands; Solomons; Bonham Islands; Vavau).—Ogilby: Australian Mus., Records, vol. 1, p. 7, 1890-91 (Howla Island, Solomons).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser. vol. 20, p. 373, 1897 (Rotuma).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 323, 1911 (Fakarava, Paumotus).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 27, 1925 (Wake Island).

Gobius coryphaenula Valenciennes: Hist. nat. Poiss., vol. 12, p. 99, 1837 (type loc., Guam).

Gobius histrio (Kuhl and Van Hasselt) Valenciennes: Hist. nat. Poiss., vol. 12, p. 100, pl. 347, 1837 (type loc., Java; Tongatabu, Friendly Islands).

Gobiodon histrio Schmeltz: Mus. Godeffroy, Cat. 4, p. 18, 1869 (Samoa).—Günther: Cruise of "Curaçoa" (Brenchley), p. 410, 1873 (Solomons).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 322, 1911 (Fakarava, Paumotus).

Gobius quinquestrigatus Valenciennes: Hist. nat. Poiss., vol. 12, p. 101, 1837 (type loc., Tongatabu).

Gobiodon quinquestrigatus Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 5, 1859 (Doreh, New Guinea).—Kner: Reise "Novara," Fische, vol. 2, p. 180, 1865 (Tahiti).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 14, 1877 (Vavao).

Gobiodon ceramensis Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 15, 1859 (Doreh, New Guinea).—Günther: Cat. fishes Brit. Mus., vol. 3, p. 88, 1861 (Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 18, 1869 (Samoa).—Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 322, 1876 (New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 182, pl. 109, fig. D, 1877 (Fiji).—Streets: U. S. Nat. Mus., Bull., no. 7, p. 96, 1877 (Samoa).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma).—Fowler: B. P. Bishop Mus., Bull. 22, p. 17, 1925 (Guam).

Gobiodon erythrophaios Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, 1859 (Doreh, New Guinea).

Gobiodon flavidus De Vis: Linn. Soc. New South Wales, Proc., vol. 8, p. 449, 1883 (type loc., Bank's Group, New Hebrides).

Gobiodon lineatus De Vis: Linn. Soc. New South Wales, Proc., vol. 8, p. 449, 1883 (type loc., Bank's Group).

Greatly like *Gobiodon verticalis*, but the body less elevated, head about deep as long and color darker. Head uniform or with narrow blue lines transversely on sides and pectoral base.

In the Bishop Museum 2 from Guam and 5 from Wake Island in 1923. The National Museum has 2 from Samoa through Steinberger and 5 from Fakarava. In the Agassiz Museum also 5 from Fakarava.

The nominal *Gobius erythrophaios* Bleeker (Bataviaasch Genoot., Verh., vol. 22, no. 3, p. 29, 1849, type loc., Bima, Sumbawa) and *Gobiodon flavidus* seem to be this species. The former is described with head and chest red, body and fins brown. The latter is said to have the head long as high; color pale greenish-yellow, orange line from over orbit along opercle edge and on pectoral base, orange band down middle of body and sometimes with 2 short blue lines on cheek opposite mouth angle. *Gobiodon lineatus* De Vis, is incompletely described though evidently quite like *Gobius histrio*. It is said to be smoky-brown, anal and caudal brownish-black. Bases of pectoral and caudal pale yellow, traversed by slender dark-edged blue line. All head and fore part of body with similar undulatory vertical lines, which become very obscure posteriorly.

Red Sea, Madagascar, East Indies, China, Queensland, Melanesia, Polynesia.

Gobiodon citrinus (Rüppell).

Gobius citrinus Rüppell: Neue Wirbelth. Fische, p. 139, pl. 32, fig. 4, 1835 (type loc., Massaua, Red Sea).

Gobiodon citrinus Schmeltz: Mus. Godeffroy, Cat. 4, p. 18, 1869 (Savay).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 181, pl. 109, fig. E, 1877 (Ponapé).—Streets: U. S. Nat. Mus., Bull. no. 7, p. 95, 1877 (Samoa).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 323, 1911 (Vavau, Tonga; Kusaie, Carolines).—McCulloch and Ogilby: Australian Mus., Records, vol. 13, p. 212, 1919 (Samoa; New Hebrides; Solomons).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 17, 36, 1925 (Guam; Samoa).—Fowler: B. P. Bishop Mus., Bull. 38, p. 27, 1927 (Palmyra).

Pseudogobiodon citrinus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 410, 1905 (1906) (Apia).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 125, 1922 (Pago Pago).

Gobiodon inornatus De Vis: Linn. Soc. New South

Wales, Proc., vol. 8, p. 449, 1883 (type loc., Bank's Group, New Hebrides).

Differs in the angular first dorsal, front spines longest. Head and pectoral base with 4 transverse blue lines.

In the Academy 4 from Apia and 32 from Pago Pago. Length 40 to 50 mm. All show black spot, less than pupil in size, at upper hind edge of gill cover. The Bishop Museum has 40 from Palmyra Island obtained by Thurston and Thaanum in 1922, and 157 from the same locality through C. Montague Cooke, Jr., in 1913. In the National Museum 6 from Apia, 4 Tuamotus, 1 Vavau, and 4 from Samoa through Steinberger. In the Agassiz Museum 4 from Apia, 1 Kusaie and 3 from Ponapé, Caroline Islands, through Rev. L. H. Gulich, 5 from Ebon Island, through Rev. B. G. Snow, and 2 from the Society Islands through Andrew Garrett.

Gobiodon inornatus De Vis is described as flesh-yellow; chin, base of pectoral and caudal yellow; spinous dorsal black edged; no markings save obscure purplish streak beneath dorsal bases.

Red Sea, Zanzibar, Seychelles, India, Nicobars, East Indies, Queensland, Melanesia, Micronesia, Polynesia.

Paragobiodon echinocephalus (Rüppell).

Gobius echinocephalus Rüppell: Atlas Reise Nord. Afrika, Fische, p. 136, pl. 34, fig. 3, 1828 (type loc., Massaua, Red Sea).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 175, pl. 108, fig. D, 1877 (Samoa; Tahiti; Tonga).—Streets: U. S. Nat. Mus., Bull., vol. 7, p. 95, 1877 (Samoa).—Steindachner: Akad. Wiss Wien, Sitz., vol. 115, pt. 1, p. 1407, 1906 (Upolu).

Kurtus echinocephalus Schmeltz: Mus. Godeffroy, Cat. 4, p. 18, 1869 (Viti Levu).

Paragobiodon echinocephalis Jordan and Seale: U. S. Bur. Fish., Bull., vol. 25, p. 397, 1905 (1906) (Apia; Pago Pago).—McCulloch and Ogilby: Australian Mus., Records, vol. 13, p. 239, pl. 34, fig. 1, 1919 (German New Guinea; Duke of York Island; Bougainville Island).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 17, 36, 1925 (Guam; Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 27, 1925 (Wake Island).—Fowler: op. cit., Bull. 38, p. 27, 1927 (Palmyra and Christmas islands).

Ruppellia echinocephalus Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 318, 1911 (Makemo and Rangiroa, Paumotus; Vavau, Tonga; Borabora, Society Islands).

Gobius amiciensis Valenciennes: Hist. nat. Poiss., vol. 12, p. 102, 1837 (type loc., Tongatabu; Carteret Harbor, New Ireland).—Kner and Steindachner: Akad. Wiss. Wien, Sitz., vol. 54, pt. 1, p. 367, 1866 (Samoa).—Peters: Akad. Wiss. Berlin, Monatsb., p. 840, 1876 (1877) (Hapai, Tonga Islands).

Kurtus amiciensis Schmeltz: Mus. Godeffroy, Cat. 4, p. 18, 1869 (Samoa).

Gobiodon xanthosoma Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 5, 1859 (Doreh, New Guinea).

Paragobiodon xanthosomus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 397, 1905 (1906) (Apia).

Ruppellia xanthosoma Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 617, 1908 (Suva, Fiji).

Gobiodon melanosoma Bleeker: Soc. Ind. Neerl., Act., no. 2, vol. 6, p. 5, 1859 (Doreh).

Awaous crassilabris (non Günther) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 84, 1906 (Shortland Island).

Ruppellia lacunicola Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 318, pl. 6, fig. 1, 1911 (type loc., Fakarava, Paumotus).

Paragobioides grandoculis Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 324, pl. 6, fig. 2, 1911 (type loc., Arhno Atoll, Marshall Islands).

Readily known by its nearly spherical head furnished with papillae or setae. Greatly variable in color, often body and fins blackish with head flesh-colored. Some uniform or head darker than body or even green.

The Bishop Museum has 2 from Shortland Island, 55 from Palmyra Island through C. Montague Cooke, Jr., in 1913, and 15 through Thurston and Thaanum from the same locality in 1922. Also 7 from Guam and 10 from Wake Island in 1923. In the National Museum 2 from Fiji obtained by the Wilkes Expedition. Also type of *Ruppellia lacunicola*, 6 from Samoa through Steinberger, and from the Bureau of Fisheries 11 from Apia, 1 Borabora, 12 Makemo. Also the type of *Paragobioides grandoculis*. The Agassiz Museum has 15 from the Society Islands obtained by Andrew Garrett, 1 Ebon Island, through Rev. B. G. Snow in April, 1877, 5 Vavau in Tonga.

There is little doubt but that *Paragobioides grandoculis* was based on a specimen of this species in which the ventrals were abnormally divided.

Red Sea, Madagascar, Andamans, Nicobars, East Indies, China, Queensland, Melanesia, Micronesia, Polynesia.

Gobiopterus farcimen Jordan and Evermann.

Gobiopterus farcimen Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 205, 1902 (1903) (type loc., Hilo).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 482, pl. 59, 1903 (1905) (type).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 10, no. 7, p. 389, 1923 (Honolulu).

Head 3 1/4; depth 5; D. VI-I, 10; A. 9; P. 16; V. I, 5; scales 25 in median lateral series to caudal base and 2 more on latter; 9 scales transversely at soft dorsal and anal origins; 8 predorsal scales to eyes; snout 4 in head measured from upper jaw tip; eye 3; maxillary 2 1/2; interorbital 3 in eye.

Body robust, moderately compressed, deepest at gill opening. Caudal peduncle well compressed, least depth 1 1/2 in its length or 2 1/2 in total head length.

Head moderately compressed, lower profile more inclined, width 1 3/5 in its length. Snout convex, length 3/5 its width. Eye large, supero-lateral, greater than snout, hind edge little behind middle in head length. Mouth large, lower jaw protruding. Maxillary reaches opposite eye. Teeth fine, in narrow bands in jaws, outer row slightly enlarged, one each side of mandible forward especially larger. Tongue depressed, moderate, truncate and free in front. Interorbital narrowly concave.

Gill opening at last fourth in head. Gill rakers 2 + 4 minute points, less than short gill filaments, which barely 1/3 of eye.

Scales with 7 basal radiating striae; apical denticles 18 + 17; circuli fine basally, laterally coarser. Scales large, firmly adherent, in even longitudinal rows, little smaller on caudal base and apparently few or absent from head. No lateral line.

Spinous dorsal inserted close behind pectoral, depressed fin not reaching soft dorsal; second spine 1 7/8 in total head length. Soft dorsal inserted midway between eye center and caudal base; first branched ray 2 in head. Anal inserted opposite soft dorsal origin, similar, only smaller; eighth anal ray 1 2/5 in head. Anal papilla well developed. Caudal convexly rounded behind, 1 1/8 in head. Pectoral large, reaches 7/8 to anal, 1 1/4 in head. Ventrals separated, origin opposite that of pectoral, fin reaches 3/4 to anal, spine 1/3 of fin, which 1 1/5 in head.

Color in alcohol pale brownish generally, under surface whitish. Sides with 6 narrow dusky lines, all along lower side variegated by as many dull obsolete blotches. Some obsolete or pale dusky streaks on head, as several broken blotches on cheek. Sides of head sprinkled with minute dusky dots. Dorsals, anal and caudal pale with dusky blotches, as 4 transverse rows of more distinct blackish blotches on caudal. Pectoral pale. Ventral with median area dusky and darker basally, edge whitish all around. Length 38 mm.

One in the Bishop Museum obtained in Honolulu in 1910 by J. W. Thompson.

The lines of pores shown on Jordan and Evermann's figure are more developed in my specimen, though less conspicuous.

Sicyopterus stimpsoni (Gill).

Sicydium (*Sicyopterus*) *stimpsoni* Gill: Acad. Nat. Sci. Philadelphia, Proc., vol. 12, p. 161, 1860 (type loc., fresh water brooks, Hilo, Hawaii).

Sicyopterus stimpsoni Streets: U. S. Nat. Mus., Bull., no. 7, p. 59, 1877 (fresh waters of Oahu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 502, 1902 (1903) (fresh waters of Honolulu).—Snyder: op. cit., vol. 22, p. 536, 1902 (1904) (Lahaina and Wailuka Rivers, Maui).

Sicydium stimpsoni Jordan and Evermann: U. S. Fish. Comm., Bull., vol. 23, pt. 1, p. 489, fig. 216, 1903 (1905) (Hilo; Heeia; Kailua).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 79, Dec., 1922 (Hilo).

Sicydium nigrescens Günther: Rept. voyage "Challenger," vol. 1, p. 60, pl. 26, fig. C, 1880 (type loc., streams of Hawaii).

Head 4 1/4 to 4 1/2; depth 4 3/4 to 7; D. VI-1, 10, 1; A. 1, 10, 1; scales mostly fallen, small, 90 in largest; 16 scales transversely; snout 2 2/3 to 3 in head; eye 4 3/4 to 7; maxillary 2 1/4 to 2 2/5; interorbital 2 1/3 to 3 1/4. Scales with 15 to 20 basal radiating striae, 3 auxiliaries; apical denticles 18 to 24, on one plane; circuli fine.

Smallest example dull brown, uniform. Obscure brown band from jaws along side of head and trunk, on former entirely below eye. Band obsolete or not evident in other examples. Dorsals and anal deep brown, soft fins with submarginal longitudinal dusky-brown band. Other fins dull brown. Largest specimen dark, shows black quite mottled with dusky to blackish.

The Academy has 6 Hawaiian specimens, of which 4 obtained by J. K. Townsend. Length 70 to 105 mm. In the National Museum 6 from Hilo, 3 Maui and 1 Oahu, 67 to 119 mm., obtained by the Wilkes Expedition. Also a series from Oahu through T. H. Streets, series from Wailalua and 9 other Hawaiian specimens. The Bishop Museum has 16 from Honolulu. Largest 128 mm. In the Agassiz Museum 1 Hawaiian, 6 Hawaiian through Andrew Garrett, 17 Honolulu through W. H. Jones in 1874, 2 Maui through C. F. Winslow, 8 Society Islands through Andrew Garrett.

Sicyopterus sarasini Weber and Beaufort.

Sicyopterus sarasini Weber and Beaufort: Nova Caledonia (Sarasin and Roux): Zool., 2nd ser., vol. 1, p. 40, 1915 (type loc., Tiouaca River; Doumcheur River, Poté, near Ni).

Head 4 4/5 to 5; depth 6 1/2; D. VI-I, 10; A. I, 10; scales 80, 13 or 14 transversely. Snout obtuse, longer than interorbital, nearly double eye, which 5 in head. Maxillary reaches eye. Upper lip without papillae, with deep median notch and small notch each side. Each jaw with 8 curved teeth, anterior and posterior strong canines. Scaled ctenoid, become small on nape and abdomen, where cycloid. Median dorsal spines prolonged as filaments, reach nearly within last half of second dorsal. Pectoral longer than head. Ventrals equal postorbital. Yellowish-brown, head and back darker. Scales near caudal with black blotches, on flanks gray blotches. First dorsal with oblique undulated gray-brown line, second with black spots between rays. Caudal and pectoral edged pale. Length 120 mm. (Weber and Beaufort)

Sicyopterus ouwensi Weber.

Sicyopterus ouwensi Weber: Nova Guinea, vol. 9, pt. 4, p. 602, 1913 (type loc., Humboldt Bay and Mbai River, north New Guinea).

Head 3 4/5 to 4; depth 4 4/5 to 5 1/5; D. VI-I, 10; A. I, 10; scales 65 to 70, 17 to 19 transversely. Head obtuse, convex. Snout 2 1/2 in head; eye 5. Maxillary nearly reaches opposite hind eye edge. Upper teeth tridentate, below 6 or 7 median small canines. Scales ctenoid, only smaller and cycloid on neck, 25 predorsal. Origin of first dorsal 1 to 1 1/3 times head from snout tip, longest spine equals head and reaches second dorsal; last rays reach caudal or equal 2/3 body depth. Anal equally high. Pectoral equals or little longer than ventral, which 2 in head.

Brown, with darker head and back. Between pectoral end and caudal base 6 diffuse dark crossbands. Fins dark brown. Anal edge darker. Caudal with 2 clear marginal bands. Pectoral with clear edge, sometimes with 2 blackish longitudinal bands. Length 110 mm. (Weber)

Sicyopterus albotaeniatus (Günther).

Sicydium albotaeniatus Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 183, pl. 110, fig. D, 1877 (type loc., brooks of Hawaiian islands).

Head 3 7/8; depth 4 2/5; D. VI-15; A. IV, 14; scales about 60, 13 transversely; snout 3 1/4 in head; eye 6 1/5, 2 in snout. Snout protruded little beyond mouth. Maxillary reaches opposite eye center. Scales uniform, small, absent from head, breast and pectoral base. Third and fourth dorsal spines longest, third 2 4/5 in combined head and body; thirteenth ray 3 1/2; caudal pointed medially, 3; pectoral 3 7/8; last anal ray 1 2/5; caudal peduncle depth 2; ventral 1 2/3. Back olive, below dull or pale greenish-brown, divided by broad white band from snout, below eye to caudal base medially. Below white band on tail row of 8 blackish round spots. Fins all dull brown, edges of dorsal, anal and caudal bluish. Iris and front of ventral pink. Length of figure 155 mm. (Günther)

Only known from 2 specimens collected by Andrew Garrett and reported by Günther.

Sicyopterus micrurus (Bleeker).

Sicydium micrurus Bleeker: Nat. Tijds. Ned. Ind., vol. 5, p. 341, 1853 (type loc., Amboina rivers).

Sicyopterus micrurus Weber and Beaufort: Nova Caledonia (Sarasin and Roux), Zool., vol. 2, pt. 1, p. 40, 1915 (brooks near Cape Colnett; Tao).

Head 4 2/3; depth 4; D. VI-I, 11; A. I, 10; scales 55 to 60, 15 transversely. Head width 1 1/2 its length. Eye 5 1/2 in head, 3 in interorbital. Upper teeth tricuspid and upper lip with slight median cleft. Row of tuberculous papillae on gum beneath upper lip and small median papilla above maxillary suture. Scales rather large, smaller on neck, belly and tail. Third dorsal spine ends in short filament not so deep as body; second dorsal not high as body. Caudal 6 in total. Pectoral equals head. Greenish above, with 8 blackish crossbars. Blackish band along side, most distinct on caudal base and along middle rays. Dorsals and anals immaculate, latter with blackish intermarginal band. Caudal with black horseshoe-like mark. Paired fins yellow. Length 86 mm. (Ogilvie-Grant)

East Indies, Melanesia.

Sicyopterus taeniurus (Günther).

Sicydium taeniurum Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 183, pl. 112, fig. C, 1877 (type loc., Namusi, Viti Levu; Aneiteum, New Hebrides).—Ogilvie-Grant: Zool. Soc. London, Proc., p. 161, 1884 (Aneiteum; Viti Levu).

Sicyopterus taeniurus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 410, 1905 (1906) (Pago Pago).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 323, 1911 (Fataua River, Tahiti).

Sicydium lagocephalum (non Pallas) Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, p. 29, 1868 (Viti Levu, Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 18, 1869 (Namusi).—Schmeltz: op. cit., Cat. 5, p. 28, 1874 (Viti Levu).

Sicydium macrostetholepis (non Bleeker) Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, p. 326, 1868 (Samoa).

Sicydium pugnans Ogilvie-Grant: Zool. Soc. London, Proc., p. 160, pl. 11, fig. 3, pl. 12, fig. 7, 1884 (type loc., Savaii, Samoa).

Sicyopterus tauae Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 410, fig. 96, 1905 (1906) (type loc., Vaisigano River, Apia, Samoa).

Head 4; depth 5 1/4; D. VI-I, 11, 1; A. I, 10, 1; scales 50 in median lateral series to caudal base and 5 more on latter; 16 scales transversely, 15 predorsal; snout 3 1/2 in head; eye 5 1/5; maxillary 2; interorbital 3 1/6.

Body compressed, robust forward, elongate. Caudal peduncle strongly compressed, least depth 1 1/4 in its length or 2 1/8 in head.

Head width 1 2/5 in its length. Snout broadly obtuse, length 2/5 its width. Eye with hind pupil edge midway in head length; diameter 1 3/4 in snout as seen in profile, 1 2/3 in interorbital. Mouth wide, gape reaches opposite front pupil edge, inferior. Row of fine, even close-set, short teeth along edge of each jaw, lower all flaring out laterally; also 12 inner larger mandibular teeth, gradually larger to symphyseal pair, each of last inclined little outward. Tongue adnate, knob-like. Front nostril midway in snout length; hind nostril little closer to front nostril than to eye. Interorbital broad, flattened.

Head naked. Third dorsal spine 2 3/4 in combined head and trunk; first branched dorsal ray 1 7/8 in head; first branched anal ray 2 1/8; caudal rounded convexly behind; pectoral 3 3/4; ventral disk 1 4/5.

Mostly uniform umber. Under surface of head, ventrals and belly pale. Length 60 mm.

In the Agassiz Museum 1 from Tataua River, Tahiti, obtained by the *Albatross*. The National Museum has 129 from Tahiti, obtained by the Wilkes Expedition. Also through the Bureau of Fisheries 2 from Tataua River in Tahiti and 1 from Samoa.

Melanesia, Polynesia.

Sicyopterus laticeps (Valenciennes).

Sicydium laticeps Valenciennes: Hist. nat. Poiss., vol. 12, p. 133, 1837 (type loc., fresh waters of Bourbon Island).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 18, 1869 (Kandavu).

D. VI-I, 11; A. I, 10. Head depth 2/3 its width, swollen before eyes. Lower teeth subequal, 6 each side. Scales uniform. Third and fourth dorsal spines subequally produced, half again high as body. Blackish, throat and abdomen somewhat more grayish. Caudal with whitish marginal tint. Length 102 mm. (Valenciennes)

Bourbon, Polynesia.

Microsicydium elegans (Steindachner).

Sicydium elegans Steindachner: Akad. Wiss. Wien, Sitz., vol. 80, pt. 1, p. 152, 1879 (1880) (type loc., Society Islands).—Ogilvie-Grant: Zool. Soc. London, Proc., p. 162, 1884 (copied).

Stiphodon elegans Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 143, pl. 2, figs. 4-5, 1913 (Batjan and Ceram).—Weber and Beaufort: Nova Caledonia (Sarasin and Roux), Zool., vol. 2, pt. 1, p. 39, 1915 (Tao River).

Microsicydium elegans Fowler: B. P. Bishop Mus., Bull. 38, p. 27, 1927 (Marquesas Islands).

Stiphodon semoni Weber: Zool. Forsch. Australien (Semon), vol. 5, p. 270, 1894 (New Guinea).—Weber: Nova Guinea, vol. 5, pt. 2, p. 264, 1908 (Klipong River and Manåpiri, north New Guinea).

Head 4 1/2 ♂ to 3 1/2 ♀; depth 7 1/4 ♂ to 6 ♀; D. VII ♂ to VI ♀, I, 9; A. I, 11; scales 32 or 33; eye 5 in head, slightly less than snout. Fourth dorsal spine prolonged in ♂, 2 3/4 in combined head and body, in ♀ 2 in head. Red above, paler below. Back dusky in ♂, head dark blue, predorsal yellowish, all vertical fins red, and pectoral with 8 transverse rows of dark dots. Female with median dusky or dark lateral band from snout tip to caudal base. Another dark band, narrower, from upper snout along upper eye edge along back and upper edge of caudal peduncle; fins pale with several rows of dark dots across dorsal and caudal. Length ♂ 32 mm., ♀ 42 mm. (Beaufort)

Head 5; depth over 6; D. VI-I, 11; A. I, 10; scales 32 or 33; snout equals eye, which 3 2/5 in head; interorbital 3 1/2. Head width 1 2/5 its length. Mouth cleft short. Head scaleless. Predorsal scales 11. Clear brownish-yellow, belly whitish. Dark brown lateral band, largely above, extending even to snout horizontally straight. Lower band over edge of belly. Length 33 mm. (Steindachner)

The Bishop Museum has 12 from the Marquesas Islands; largest 28 mm.

East Indies, Melanesia, Polynesia.

Lentipes seminudus Günther.

Lentipes seminudus Günther: Rept. voyage "Challenger," vol. 1, p. 61, 1880 (type loc., fresh water of Honolulu).

Head 4; D. VI-11; A. 10. Eye small, in front half of head. Tail covered with small scales, head and trunk naked. Vent somewhat nearer caudal base than head. Length 50 mm. (Günther)

In the National Museum 3 from Maui, obtained by the Wilkes Expedition.

Lentipes concolor (Gill).

Sicyogaster concolor Gill: Acad. Nat. Sci. Philadelphia, Proc., p. 102, 1860 (type loc., fresh waters of Hilo).

Lentipes concolor Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 184, 1877 (Hilo).—Günther: Rept. voyage "Challenger," vol. 1, p. 61, 1880 (streams of Hawaii).

Head 5; D. VI, 11; A. 10. Body subcylindrical. Head oblong, depressed, higher than wide, round in front. Eye moderate, subanterior. Mouth cleft horizontal. Teeth in jaws uniserial, front upper ones tricuspid, lower wide set; lower lip with series of minute teeth. Body scaleless. Dorsal spines flexible. Caudal free. Ventrals united in short, semicircular disk, adherent to belly. Purplish. Anal bordered with purple. Paired fins partly pearly. (Gill)

Differs from *Lentipes seminudus* in the absence of scales.

Pleurosicya boldinghi Weber.

Pleurosicya boldinghi Weber: Siboga Exped., vol. 65, p. 457, fig. 88, 1913 (type loc., west New Guinea in S. Lat. 1° 42.5′ E. Long. 130° 47.5′ in 32 m.).

Head 3; depth 5; D. VI-1, 9; A. 9; scales 24 in median lateral series to caudal base and 2 more on latter, 8 transversely, 8? predorsal; snout 3 1/4 in head from upper jaw tip; eye 3; maxillary 2 1/2. Front edge of tongue convex. Gill membranes separated by isthmus.

Pale brown generally. Scattered dull brown spots of small size above. Dusky line from snout tip to eye, another below and parallel from middle of maxillary to eye. Dozen small brown spots down middle of back. Black spot at caudal base medially little smaller than pupil. Caudal barred with gray. Pectoral base with 2 brown spots. Length 40 mm.

In the Bishop Museum 1 from Wake Island in 1923.

East Africa, Madagascar, Bourbon, Mauritius, India, Siam, East Indies, China, North Australia, Melanesia, Polynesia.

Glossogobius tongarevae Fowler (fig. 62).

Glossogobius tongarevae Fowler: B. P. Bishop Mus., Bull. 38, p. 27, 1927 (type loc., Tongareva Island).

Allied with *Glossogobius giuris* but differs in its coloration and different physiognomy.

FIGURE 62.—Drawing of *Glossogobius tongarevae*.

Head 2 1/2; depth 3 2/3; D. V-8; A. 8; scales 25, 9 transversely; snout 2 7/8 in head; eye 4 1/2, 1 1/2 in snout, greater than interorbital. Body cylindrical. Teeth uniserial; below band of front inner teeth with 2 curved canines. Scales ctenoid, 8 predorsal; absent from pectoral and head, except nape. Front dorsal rays greater than body depth. Caudal and pectoral rounded, equal space between front eye edge and hind tip of opercle. Ventral broad, reaches vent. Yellowish, only one example with dark blotch on first dorsal. Length 31 mm. (Weber)

Glossogobius giuris (Buchanan-Hamilton).

Gobius giuris Buchanan-Hamilton: Fishes of Ganges, pp. 51, 366, pl. 33, fig. 5, 1822 (type loc., all fresh waters of Gangetic provinces).—Kner: Reise Novara, Fische, vol. 2, p. 173, 1865 (Tahiti).—Weber: Nova Guinea, vol. 5, pt. 2, p. 260, 1908 (Möso, Mamåpiri, Tawarin River, Klipong River, Sentani Lake, north New Guinea; Wagani, south New Guinea).—Weber: Nova Guinea, vol. 9, pt. 4, p. 600, 1913 (Lorentz River, Sermowai River and Lake Sentani).—Regan: Zool. Soc. London, Trans., vol. 20, pt. 6, p. 276, 1914 (Utukwa River, north New Guinea).—Weber and Beaufort: Nova Caledonia (Sarasin and Roux), Zool., vol. 2, pt. 1, p. 37, 1915 (Bondé; Tchalabel; La Foa).

Glossogobius giuris Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 27, 1925 (Wake Island).

Gobius circumspectus Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 267, 1883 (type loc., Milne Bay in fresh water, New Guinea).—McCulloch and Ogilby: Austral. Mus., Records, vol. 13, p. 235, 1919 (type).

The B. P. Bishop Museum has the type and 7 paratypes; largest the type, which 30 mm.

Glossogobius celebius (Valenciennes).

Gobius celebius Valenciennes: Hist. nat. Poiss., vol. 12, p. 56, 1837 (type loc., fresh waters of Celebes).—Weber: Nova Guinea, vol. 9, pt. 4, p. 600, 1913 (Lorentz River, Mbai River, Salzquellet, Sermowai River).—Regan: Zool. Soc. London, Trans., vol. 20, pt. 6, p. 276, 1914 (Mimika River, New Guinea).

According to Weber differs from *Glossogobius giuris* in less than 20 predorsal scales, space from snout tip to hind eye edge greater than postorbital and first dorsal with black spot posteriorly. Reaches 150 mm.

East Indies.

Glossogobius biocellatus (Valenciennes).

Gobius biocellatus Valenciennes: Hist. nat. Poiss., vol. 12, p. 55, 1837 (type loc., Pondicherry).

Glossogobius biocellatus Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 320, 1911 (Makemo, Paumotus).

Glossogobius vaisiganus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 403, fig. 93, 1905 (1906) (type loc., Vaisigano River at Apia, Samoa).

Head 3 1/10; depth 6 1/2; D. VI-10; A. 9; scales 29, 9 transversely; snout 4 in head; eye 4 3/5, 1 1/5 in snout; interorbital 4 1/5 in eye. Snout long, pointed. Mandible protruded. Maxillary almost reaches vertical of hind orbital edge. Outer row of curved subulate teeth above, decreasing backwards and inner row of large, acicular, depressible teeth and intermediate series

of minute ones between; front mandibular teeth with fixed ones smaller laterally and minute ones lost on sides. Tongue deeply notched. Gill membranes united across isthmus. Scales as in *Glossogobius giurus*. Caudal somewhat pointed, lower rays obliquely truncate.

Brown, scales on lower half of sides lighter, with broad brown margins. About 6 dark blotches along sides and 3 or 4 narrow, dark, horizontal lines along series of scales. Head dark speckled, with light marking from eye to mouth. First dorsal dark, with some broad lighter markings basally; dark blotch between first and second spines, and black, light-edged ocellus between fifth and sixth spines. Second dorsal dark, with microscopic, blackish dots, which form darker spots in irregular rows. Anal blackish, rays lighter and some white spots posteriorly. Caudal gray above, with indefinite darker bars; lower portion bears 3 or 4 broad dark crossbars, which darkest basally and separated by light interspaces. Pectoral with dark horizontal bar on lower portion of its base. Ventrals with dark transverse bars. Length 85 mm. (McCulloch and Ogilby)

One from Makemo in the National Museum.

India, East Indies, Queensland, Polynesia.

Gobius baliuroides Bleeker.

Gobius baliuroides Bleeker: Bataviaasch Genoot., Verh., no. 3, vol. 22, p. 26, 1849 (type loc., Sumanap, east Madura).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 18, 1869 (Namusi).

Head 4 1/2 in total; depth 7; D. VI-I, 10; A. I, 10; scales 25?. Body elongately compressed. Head width 1 3/4 its length. Eye 3 in head. Mouth oblique, reaches front eye edge. Teeth in villiform bands, outer row conic and lower jaw with small lateral canine each side. Spinous dorsal high as body. Second dorsal and anal pointed. Caudal obtusely rounded, long as head. Brown. Round brown spot near middle of caudal base. Length 57 mm. (Bleeker)

East Indies.

Gobius tambujon Bleeker.

Gobius tambujon Bleeker: Nat. Tijds. Ned. Ind., vol. 7, p. 319, 1854 (type loc., Perdana, River Panimbang; Batavia, River Tjilitwong, Java).—Weber: Nova Guinea, vol. 5, pt. 2, p. 259, 1908 (Merauke, south New Guinea).

Head 4 or 4 1/3 in total; depth 5 or 5 1/2; D. VI-I, 7; A. I, 6; scales 25 or 26. Head depth 3/4 to 5/7 its length. Snout obtuse, convex, shorter than eye, which 3 in head and very close together. Mouth cleft very oblique. Maxillary reaches below posterior half of eye. Outer upper teeth enlarged; no canines. Third dorsal spine longest. Caudal rounded. Green, with 2 alternate series of brownish dots. Dorsal with 2 or 3 longitudinal, caudal with 4 or 5 transverse brownish stripes (Bleeker)

East Indies.

Gobius romeri Weber.

Gobius romeri Weber: Senckenberg. Nat. Ges., Abhand., vol. 34, pt. 1, p. 39, 1911 (type loc., Aru Islands, fresh water).

Gobius sp. Weber and Beaufort: Nova Caledonia (Sarasin and Roux), Zool., vol. 2, pt. 1, p. 39, 1915 (Bondé).

Head 3 2/5; depth 3 4/5; D. V-9; A. 8; scales 28, 7 transversely. Eye within front half of head in which 3. Maxillary reaches little beyond eye. Teeth fine, without canines. Interorbital less than pupil and somewhat concave. Scales ctenoid, absent from jaws but cover opercle, 9 between first dorsal and head. First dorsal lower than second and like anal not reaching rounded caudal. Ventrals extend nearly to vent. Brownish-yellow, with deeper spots transversely on most scales. Two black ill-defined bands on abdomen, one behind ventral base, other at level of genital pore. Black spot at origin of anal and second on posterior part of fin, also 2 others on caudal peduncle below. Head irregularly spotted, with oblique spot on front eye edge. First dorsal with large spot posteriorly to middle of base; second with 3 rows of black spots. Membrane of anal and ventral blackish. Caudal with transverse irregular black bands. Length 35 mm. (Weber and Beaufort)

East Indies, Melanesia.

Gobius sadanundio Buchanan-Hamilton.

Gobius sadanundio Buchanan-Hamilton: Fishes of Ganges, pp. 52, 366, 1822 (type loc., Estuaries near Calcutta).

Gobius sedanundio Schmeltz: Mus. Godeffroy, Cat. 4, p. 18, 1869 (Kanathia).

Head 3 1/2; depth 4; D. VI-I, 8; A. I, 8; scales 28 to 30, 8 transversely; 4 in head; eye 4, 1 1/4 in interorbital. Head width long as head without snout. Mouth nearly horizontal, jaws equal. Maxillary reaches below middle or last third of orbit. Teeth villiform, outer upper row enlarged; no canines. Scales ctenoid; 10 extend forward until between eyes; on opercles and rudimentary on cheeks. Second and third dorsal spines elongated, filamentous. Caudal rounded.

Olive, with very large deep black, white-edged blotches scattered over body. First dorsal black, with white ring on last 3 rays. Second dorsal with 2 rows of black spots along base and third of white dots along center. Anal dark olive, edged black. Caudal with numerous fine black dots. Ventral black in center, edges orange. Reaches 77 mm. (Day)

India, Burma, Polynesia.

Gobius ornatus Rüppell.

Gobius ornatus Rüppell: Atlas Reis. Nord. Afrika, Fische, p. 135, 1828 (type loc., Massaua, Red Sea).—Günther: Cat. fishes Brit. Mus., vol. 3, p. 21, 1861 (Fiji).—Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 18, 1869 (Namusi).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 172, pl. 3, fig. A, 1877 (Fiji; Yap; Puynipet; Ponapé).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 267, 1883 (Milne Bay, New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 84, 1906 (Shortland Island).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 401, fig. 91, 1905 (1906) (Apia; Pago Pago).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 319, 1911 (Moen, Truk Group, Carolines; Tonga; Suva, Fiji).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 139, 1913 (Saonek, Waigiu).—McCulloch and Ogilby: Australian Mus., Records, vol. 13, p. 227, pl. 33, fig. 2, 1919 (New Hebrides).

Gobius oligolepis (non Bleeker) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 84, 1906 (Faté).

Petroscirtes rhinorhynchus (non Bleeker) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 89, 1906 (Faté).

Head 3 3/5 to 3 3/4; depth 5 to 5 1/4; D. VI-I, 10, 1; A. I, 8, 1; scales 26 or 27 in median lateral series to caudal base and 3 more on latter; 9 scales transversely at second dorsal and anal origins; 9 to 12 predorsal scales; snout 3 1/5 to 3 1/3 in head; eye 3 4/5 to 4; maxillary 2 2/5 to 2 2/3; interorbital 2 1/5 in eye.

Body elongate, compressed, deepest at soft dorsal origin. Caudal peduncle well compressed, least depth 1 3/4 in its length or 2 1/8 to 2 1/5 in head.

Head width 1 1/3 in its length. Snout convex, obtuse, length 3/5 its width. Eye large, hind edge midway in head length; diameter slightly less than snout length. Mouth large, lower jaw slightly shorter. Maxillary

reaches front pupil edge. Teeth fine, in bands in jaws. Tongue with front edge broad and slightly convex, not notched. Nostrils small; front one at last 2/5 in snout; hind nostril close before eye, nearer latter than anterior nostril. Interorbital level, scarcely concave.

Gill opening 2 3/4 in head. Gill rakers 4 + 6, lanceolate, 1 1/2 in gill filaments, which 1 3/4 in eye.

Scales with 10 to 12 basal radiating striae; apical denticles 30 to 32 + 28 to 30; circuli minute. Head largely scaly, except muzzle.

Third dorsal spine 1 3/4 in head; tenth dorsal ray 1 1/2; eighth anal ray 1 1/3; caudal 1, rounded; pectoral 1; ventral 1 1/8 to 1 1/6.

Brownish generally, becoming pale or whitish on under surface of head and belly. Sides with about 5 longitudinal dark brown streaks, broken as blotches or bars and those of 2 lowest series broadest. Dorsals dull brownish, with deep brown horizontal lines or streaks. Anal pale, with horizontal dusky lines. Caudal dull brownish, finely spotted with darker. Pectoral brownish, with whitish dots. Ventral brownish, becoming dusky terminally. Length 65 mm.

One in the Agassiz Museum obtained by R. Torrey in 1862 in the Pelew Islands, also 4 from Truck, 1 from Tonga and 1 from Suva. The Bishop Museum has 3 from Faté, 54 to 78 mm. The National Museum has 5 from Samoa, 2 from Moen and 3 from Truck.

Red Sea, India, Andamans, East Indies, Philippines, northwest Australia, Queensland, Melanesia, Micronesia, Polynesia.

Gobius variabilis Steindachner.

Gobius variabilis Steindachner: Senckenbergische Nat. Ges. Abhand., vol. 25, p. 430, pl. 18, fig. 4 b, 1900 (type loc., Ternate).—Beaufort: Bijd. Dierk. Amsterdam, vol. 13, p. 137, 1913 (Saonek).

Head 3 1/6 to 3 2/5; depth 4 1/4; D. VI-I, 9; A. I, 8; scales 38, transversely 15 or 16, predorsal 18 or 19; eye 3 1/2 to 4 in head, greater than snout, separated by narrow frenum; head broader than long; mouth broad, reaches eye; cheeks scaleless, with rows of pores; opercle scaly above; predorsal scales not extending forward to eyes; upper pectoral rays silky; caudal rounded, long as pectoral and both less than head. Brown with darker blotches; side of head and pectoral with brown spots; obscure brown spots on dorsal spines and rays. Length 43 mm. (Steindachner)

Gobius caninus Valenciennes.

Gobius caninus Valenciennes: Hist. nat. Poiss., vol. 12, p. 65, 1837 (type loc., Java).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 18, 1869 (Namusi).—Günther: Mus. Godeffroy, Jour., vol. 7, pt. 11, p. 175, pl. 109, fig. C, 1877 (west Polynesia).

Head 4 1/2 to 4 3/4; depth 5 1/2 to 6; D. VI-I, 9; A. I, 9; scales 27 to 30, 9 transversely. Eyes at second quarter in head, very close together. Two lower canines. Series of minute warts on cheek. Scales large, small on occiput. First dorsal lower than body; second and third spines produced in male. Caudal obtusely rounded. Greenish, with large, irregular, brown spots, disposed in 2 alternate longitudinal series and with numerous yellow dots. Blue spot on shoulder. (Günther)

East Indies, China.

Gobius hoevenii Bleeker.

Gobius hoevenii Bleeker: Nat. Tijds. Ned. Ind., vol. 2, p. 426, 1851 (type loc., Sambas, Borneo).—Weber: Nova Guinea, vol. 5, pt. 2, p. 260, 1908 (Trambuai Lake, north New Guinea).—Weber and Beaufort: Nova Caledonia (Sarasin and Roux), Zool., vol. 2, pt. 1, p. 38, 1915 (Oubatche).

Head 4 1/2 in total; depth 5; D. VI-I, 7; A. I, 7; scales 30. Head little wider than high. Snout obtuse, convex, not longer than eye, which 3 1/2 in head and equals interorbital. Mouth cleft scarcely oblique, jaws equal. Maxillary reaches below orbit. Teeth very small. Dorsals lower than body. Caudal rounded. Greenish, variegated blackish. First dorsal black basally, white ring around middle. Second dorsal with series of brown basal spots. Other fins green. (Günther)

East Indies, Melanesia.

Gobius concavifrons Ramsay and Ogilby.

Gobius concavifrons Ramsay and Ogilby: Linn. Soc. New South Wales, Proc., 2nd ser., vol. 1, p. 12, 1886 (type loc., Strickland River, New Guinea).

Head 4 1/3 in total; depth 5 3/4; D. VI, I, 10; A. I, 8; scales 34, 10 transversely; eye 4 1/5 in head, 1 3/8 in snout, 2/9 diameter apart. Snout obtuse, profile concave posteriorly. Mouth oblique, mandible protrudes. Maxillary barely to eye. Several rows of small teeth in jaws, outer row enlarged, especially in front. Interorbital convex. Scales on neck much smaller than on body, 20 predorsal. Third dorsal spine longest, not high as body depth. Anal begins below fourth dorsal ray; anal papilla prominent. Caudal moderately pointed. Pectoral reaches vent, ventral not so far. Above light brown, many of scales with dark spot posteriorly. Below gray. Second dorsal and caudal spotted with dark brown, latter tipped same. Length 101 mm. (Ramsay and Ogilby)

Gobius petrophilus Bleeker.

Gobius petrophilus Bleeker: Nat. Tijds. Ned. Ind., vol. 4, p. 476, 1853 (type loc., Batavia, near Onrust Island).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 5, 1859 (Doreh, New Guinea).

Head 4 in total; depth 6 1/3; D. VII-I, 9; A. I, 9; scales 35. Head broader than deep. Snout convex, shorter than eye, which 3 3/4 in head and 1/2 diameters apart. Mouth cleft oblique. Outer series of teeth enlarged; no canines. Head naked, scales on neck smaller than on body. First dorsal half high as body. Caudal rounded. Brownish-red, clouded brown superiorly. Rays of other vertical fins and of pectoral, dotted with brown. (Günther)

East Indies.

Gobius elegans Valenciennes.

Gobius elegans (Kuhl and Van Hasselt) Valenciennes: Hist. nat. Poiss., vol. 12, p. 44, 1837 (type loc., Java; New Guinea; Vanicolo).

Head 5 in total; depth 6; D. VI-I, 10; A. I, 9; scales 36, 9 transversely. Snout obtuse. Teeth small, equal. Front dorsal rather lower than second, which high as body depth. Caudal rounded. Upper pectoral rays silk-like. Buff, minutely dotted brown. Upper half of sides with 3 or 4 indistinct lines, each formed by series of very short brown streaks, beneath which series of indistinct brown spots. Blackish spot at hind eye edge, second at upper part of pectoral base and third at lower part of base, spreading on gill membrane. Dorsal membranes with 3 or 4 indistinct series of blackish spots and few similar on caudal membrane. (Günther)

India, East Indies, Melanesia.

Gobius ophthalmicus Weber.

Gobius ophthalmicus Weber: Leyden Mus., Notes, vol. 31, p. 150, 1909 (type loc., Lombok).—Weber: Siboga Exped., vol. 6, p. 463, fig. 90, 1913 (type).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 139, 1913 (Saonek, Waigiu).

Head 3 1/2; depth 4 3/4; D. VI-10; A. 9; scales 38,

transversely 14; eye 3 in head, longer than snout; teeth pluriserial, outer row larger; head scaleless; scales ctenoid, small on front part of body, large on tail; predorsal scales small, extend forward nearly to eyes; caudal rounded; upper pectoral rays silky. Yellowish brown, with row of median dark blotches on side; dark spot behind eye; first dorsal with dark longitudinal band and 3 on soft dorsal; caudal with dark crossbands; paired fins yellowish. Length 34 mm. (Weber)

Gobius viridipunctatus Valenciennes.

Gobius veridi-punctatus Valenciennes: Hist. nat. Poiss., vol. 12, p. 47, 1837 (type loc., Bombay).

Gobius venenatus Weber: Nova Guinea, vol. 5, pt. 2, p. 261, 1908 (Merauke River, south New Guinea).

Head 3 4/5; depth 4; D. VI-I, 10; A. I, 9; scales 34 to 38, 9 transversely; snout 3 4/5 in head from snout tip; eye 3 3/5, 1/3 diameter apart. Mouth oblique, mandible protruding. Maxillary reaches below middle of eye. Teeth villiform; outer upper row enlarged and with 2 to 4 canines; lower 12 to 16 enlarged outer of which recurved canine and 2 to 4 internal canine-like teeth above symphysis, some of internal row laterally conic. Scales ctenoid; 32 predorsal to eye; few on opercle above. Cheeks swollen, with many rows of papillae, pitted with age. Dorsal spines moderately flexible, with short filamentous ends, height 2/3 body depth. Last dorsal ray variably 2/3 to slightly beyond caudal base. Caudal rounded. Pectoral long as head without snout.

Olive, with series of 4 to 5 large, badly defined blotches along sides. Many scales with light center, emerald-green in life. Dorsals dark basally, usually with light edges with dark basal band. Caudal, anal and ventral gray, first with light upper edge. Reaches 127 mm. (Day)

India, East Indies.

Gobius ophthalmoporus Bleeker.

Gobius ophthalmoporus Bleeker: Nat. Tijds. Ned. Ind., vol. 5, p. 340, 1853 (type loc., Amboina).—Weber: Nova Guinea, vol. 9, pt. 4, p. 599, 1913 (Lorentz River at Bivak Island).

Head 5 1/4 to 5 3/4 in total; depth 6 to 7; D. VI-I, 10; A. I, 10; scales 45. Head deeper than wide, width half its length. Snout obtuse, long as eye. Eye in front half of head, 4 in head, 1/2 diameter apart. Mouth cleft oblique, reaches below front edge of orbit. Teeth with outer series enlarged; no canines. Large postocular pore. Dorsals not elevated, third spine longest. Caudal rounded. Head, body and pectorals uniform green. First dorsal with blackish-violet longitudinal streaks; second dorsal with series of violet spots. Anal edge blackish. (Günther)

East Indies.

Gobius cyclopterus Valenciennes.

Gobius cyclopterus Valenciennes: Hist. nat. Poiss., vol. 12, p. 44, 1837 (type loc., Cartaret Harbor, New Ireland).

D. VI-I, 9; A. I, 8. Head 4 in total, large, long as broad, length nearly double its depth. Ventral round as in *Sicydium*. Gray, marbled indistinctly purple-brown. Length 51 mm. (Valenciennes)

Gobius reticularis Weber.

Gobius reticularis Weber: Senckenbergische Nat. Ges., Abhand., vol. 34, p. 38, fig. 7, 1911 (type loc., Wokamar, Wokam, Aru Islands; Sungi Manumbai; Papakula; Seltutti).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 140, 1913 (Rabai River, Waiha River and upper Tuba River, Waigiu).

Head 3 1/3; depth 5 1/4; D. VI-I, 7; A. I, 6; scales 26, transversely 7, predorsal 7; eye 3 1/2 in head, greater than snout; mouth cleft extends little beyond front eye edge, oblique; scales ctenoid; head and thorax before pectoral and ventral bases naked; pectoral rays not free; first dorsal spine 1 3/4 in head; first dorsal ray 2; fourth anal ray 1 3/4; caudal 3 1/8 to caudal base; pectoral 3 1/10; ventral 3 3/4. Brownish or yellowish, with darker borders to scales. Upper terminal third of first dorsal black. Length 22 mm. (Weber)

Bathygobius fuscus (Rüppell).

Gobius fuscus Rüppell: Atlas Reis. Nord. Afrika, Fische, p. 137, 1828 (type loc., Red Sea).

Mapo fuscus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 483, fig. 212, 1903 (1905) (Honolulu; Hilo; Moanalau; Waialua; Waikiki; Waianae; Kailua).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 402, 1905 (1906) (Vailele; Aua; Pago Pago).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 320, 1911 (Makemo and Rangiroa, Paumotus; Vavau, Tonga; Kusaie, Carolines; Arhno Atoll, Marshalls).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).

Bathygobius fuscus Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 2, p. 78, Dec., 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 17, 38, 1925 (Guam; Tahiti).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 26, 1925 (Nihoa, Necker, Lisiansky, Johnston and Wake islands).—Fowler and Bean: U. S. Nat. Mus., Proc., vol. 71, 1927 (Tahiti).—Fowler: B. P. Bishop Mus., Bull. 38, p. 28, 1927 (Christmas, Tongareva, Howland, Lisiansky, Necker, Laysan islands).

Gobius nebulopunctatus Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).

Gobius albopunctatus Kner: Reise "Novara," Fische, vol. 2, p. 173, 1865 (Tahiti).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 172, pl. 110, fig. A, 1877 (Fiji; Society Islands; Samoa, Kingsmills; Hawaiian islands).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 229, 1898 (Guam).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 517, 1900 (Hawaiian islands).—Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 135, 1902 (1903) (Marcus Island).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 502, 1902 (1903) (Honolulu).—Waite: Australian Mus., Records, vol. 5, p. 3, 1903 (Paanopa, Ocean Island, Gilberts).—Snyder: U. S. Fish Comm., Bull., vol. 22, p. 536, 1902 (1904) (Honolulu).—Regan: Zool. Soc. London, Proc., pt. 1, p. 404, 1909 (Christmas Island, Indian Ocean).

Eleotris melanosoma (non Bleeker) Schmeltz: Mus. Godeffroy, Cat. 4, p. 18, 1869 (Samoa).

Gobius soporator (non Valenciennes) Schmeltz: Mus. Godeffroy, Cat. 5, p. 28, 1874 (Samoa; Tonga).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 173, pl. 111, fig. B, 1877 (Samoa; Tonga).

Mapo soporator Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 84, 1906 (Makatea; Tahiti; Nukuhiva).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 147, 1912 (Mangareva, Gambier Islands).

Gobius caledonicus Sauvage: Soc. Philom. Paris, Bull., 7th ser., vol. 4, p. 46, 1879 (type loc., New Caledonia).

Gobius ornatus (non Rüppell) Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 523, 1900 (Tahiti).

Mapo crassiceps Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 403, fig. 92, 1905 (1906) (type loc., Vaisigano River and Apia Bay, Samoa).

Head 3 to 3 1/2; depth 4 1/4 to 5 1/4; D. VI-1, 9, 1; A. 1, 8, 1; scales 30 to 35 in median lateral series to caudal base and 2 to 4 more on latter; 11 to 13 scales transversely; 20 to 22 predorsal scales; snout 3 1/3 to 4 3/4 in head; eye 3 1/4 to 5; maxillary 2 1/3 to 3; interorbital 1 1/4 to 2 1/3 in eye.

Scales with 38 or 39 basal radiating striae; apical denticles 35 to 40 + 31 to 37, mostly developed; circuli

fine, irregular. The largest adult shows a little bar of pores between nostrils joining short branch below and following down behind maxillary to its hind edge, then sending 2 branches horizontally across cheek, upper of which slightly forked. Below eye short line of pores horizontally and also lower and close to maxillary fork short parallel bar on cheek. Row of pores along each outer face of mandibular rami, continued up close along hind preopercle edge less distinct. Short oblique row of pores on opercle and another longer row behind preopercle flange. Tongue notched in front.

In the Academy 12 Hawaiian specimens, of which 1 obtained by J. K. Townsend, and 1 from Tahiti through Andrew Garrett. Length 28 to 104 mm. The National Museum has a large series of Hawaiian specimens, more than 800, many from Pearl Harbor and Honolulu, also 286 from the last locality through the *S. S. Albatross,* 3 from T. H. Streets and 7 from W. H. Jones. Also a series from Apia, 33 Mangareva, 5 Rangiroa, 4 Makemo, 1 Arhno Atoll. The Bishop Museum has 23 from Honolulu, 1 Hilo, 1 Laie Stream on Oahu through C. Montague Cooke III, on November 7, 1918, at Waikiki 1 from C. H. Edmondson in 1922 and 5 from W. A. Bryan 1912 to 1916, 2 from Pearl City through J. W. Thompson in 1918; 1 from Palmyra Island through Thurston and Thaanum in 1922, 2 Tahiti, 2 Marcus Island, 1 Shortland Island, 1 Rarotonga, 4 Makatea, 5 Nukuhiva. I obtained several on the reef at Pearl City October 15, 1922. Three from Guam, 4 Nihoa, 4 Necker Island, 2 Lisiansky, 1 Laysan, 4 Johnston Island and 1 Wake Island in 1923. The Agassiz Museum has 28 Hawaiian specimens from Andrew Garrett, of which 21 from Honolulu, 2 Maui from C. F. Winslow, 4 Kingsmill Islands from Andrew Garrett, 1 Vavau, 2 Tonga, 10 Society Islands from Andrew Garrett, 2 Ebon Island, Marshall Islands, from Rev. B. G. Snow in 1877, 1 Kusaie.

Gobius caledonicus Sauvage is apparently this species, as its formula of fins, scales and proportions agree, also the upper pectoral rays are said to be silky. Jouan describes it under *Gobius* (Soc. Cherbourg, Mem., vol. 9, p. 117, 1863) from a specimen 150 mm. obtained at Kanala, New Caledonia.

Red Sea, Mozambique, Mauritius, India, Andamans, East Indies, China, Queensland, Melanesia, Micronesia, Polynesia, Hawaii.

Chlamydes cotticeps (Steindachner).

Gobius cotticeps Steindachner: Akad. Wiss. Wien, Sitz., vol. 80, pt. 1, p. 137, pl. 1, figs. 2-a, 1879 (1880) (type loc., Society Islands).

Chlamydes laticeps Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 503, fig. 43, 1902 (1903) (type loc., reef at Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 486, fig. 214, 1903 (1905) (type).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 10, no. 7, p. 389, 1923 (Hawaii).

Head 3; depth 4; D. VI-I, 9, 1; A. I, 8, 1; scales 39 in median lateral series to caudal base and 3 more on latter; 14 scales transversely; 26 predorsal scales; snout 4 in head; eye 3 3/4; maxillary 2 1/5; interorbital 2 1/3 in eye. Least depth of caudal peduncle 3 in head; head width 1 2/5; third dorsal spine 2 1/4; first dorsal ray 2 2/5; third anal ray 2 1/5; pectoral 1 1/6; ventral 1 3/5.

The Bishop Museum has 3 from Laie, Oahu, November 7, 1918, collected by C. Montague Cooke III. All in poor preservation and 62 to 70 mm. long. The type of *Chlamydes laticeps* in the National Museum.

There appear to be no distinctions for the Hawaiian fish. Steindachner gives a more variegated color pattern, as the head and predorsal, interdorsal blotch and another on caudal peduncle, pale or gray.

Gnatholepis anjerensis (Bleeker).

Gobius anjerensis Bleeker: Nat. Tijds. Ned. Ind., vol. 1, p. 251, fig. 11, 1850 (type loc., Anjer [in mari?]).

Gnatholepis anjerensis Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 27, 1925 (Wake Island).

Gobius canalae Sauvage: Soc. Philom. Paris, Bull., 7th ser., vol. 5, p. 102, 1881 (type loc., Canala, New Caledonia).

Gobius deltoides Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 125, 1900 (type loc., Guam).

Gnatholepis deltoides Jordan and Seale: Bur. Fish., Bull., vol. 25, p. 394, fig. 84, 1905 (1906) (Apia; Pago Pago).

Gnatholepis knighti Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 204, 1902 (1903) (type loc., Honolulu; Hilo; Waianae).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 487, pl. 58, 1903 (1905) (Hilo; Honolulu; Waianae; Waikiki).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 78, Dec., 1922 (Hilo).

Gobius (Gnatholepis) knighti Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 138, 1913 (Saonek, Waigiu).

Gnatholepis samoensis Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 396, 1905 (1906) (name in text=*Gnatholepis deltoides* Jordan and Seale).

Head 3 1/4 to 3 1/2; depth 4 1/2 to 4 3/4; D. VI-1, 11, 1; A. I, 10, 1 to 12, 1; P. 16; V. I, 5; scales 26 to 31 in median lateral series to caudal base and 2 or 3 more on latter; 10 scales transversely at soft dorsal origin, 8 or 9 predorsal scales; snout 2 7/8 to 3 1/4 in head; eye 3 1/5 to 4; maxillary 3 to 3 1/5; interorbital 8.

Body compressed, elongate, deepest about anal origin. Caudal peduncle well compressed, least depth 1 1/6 in its length or 2 1/2 in head.

Head compressed, cheeks but little swollen, upper profile more convex than lower; width 1 3/5 in its length. Snout convex over surface and in profile, long as wide as measured at front of eyes. Eye large, hind pupil edge nearly midway in head length; diameter 1 1/5 in snout; interorbital nearly 3 times eye. Mouth moderate, jaws even. Maxillary reaches opposite front eye edge. Lips entire. Teeth fine, simple, conic, in bands in jaws, outer series little enlarged, especially lower, which with antero-lateral canine curved back each side. Tongue rather widely notched in front. Front nostril at last third in snout; hind nostril half way between front one and eye. Interorbital narrowly concave.

Gill rakers 1 + 4, lanceolate, 2/5 of gill filaments, which 1 2/3 in eye. Scales with 6 to 11 basal radiating striae, of which 1 to 4 more above or below; apical

denticles 16 to 19 + 17 to 21; circuli fine. Cheek scaly, most scales fallen; muzzle naked.

Spinous dorsal with only tips free, not very flexible or filamentous; fourth spine 2 in head; tenth dorsal ray 1 1/3; ninth anal ray 1 1/2; caudal 1; pectoral 1 1/5; ventral 1.

Faded brownish, paler on belly and under surface of head. Brown streak from below eye across cheek. Iris mottled coppery-brown. Pectoral with fine alternating waved white and brown transverse bands or lines. Spinous dorsal with 4 horizontal parallel brown bands. Soft dorsal brownish on membranes, broken as blotches on fin terminally, especially in front. Anal brownish, especially terminally. Caudal brownish, with about 16 slightly darker transverse lines. Ventral brownish, deeper terminally. Length 46 mm.

In the Agassiz Museum 1 from Society Islands, obtained by Andrew Garrett. It agrees in many respects with Bleeker's figure, especially in the ventrals little longer than the pectorals and the scaly cheeks. Bleeker, however, does not describe the color. Also a specimen 45 mm. long in the same museum from Oahu, Hawaii, 45 mm. long, obtained by H. Mann. This does not in any way differ from the Society Island example. In the Academy 5 Hawaiian specimens, 32 to 52 mm. The Bishop Museum has 5 from Honolulu and 18 types of *Gobius deltoides* from Agaña on Guam. Largest 56 mm. One from Wake Island in 1923. In the National Museum 5 from Apia.

Bleeker's outline figure of *Gobius anjerensis* may very readily be based on a specimen with distended jaws, which would account for the short mouth gape. The scales are, however, correctly shown as smaller on the head than on the trunk. While crude and very irregularly drawn, they show about 27 rows to the caudal base and 2 or 3 more on the trunk. Transversely at the anal origin about 10 scales are indicated. *Gobius canalae* Sauvage is a synonym, to judge from its description. It is said to have but 7 scales transversely. Other synonyms are *Gobius deltoides* Seale and *Gnatholepis knighti* Jordan and Evermann. Jordan and Seale propose *Gnatholepis samoensis* as another name, apparently without intention, for their Samoan specimens and evidently their figure 84 is from the same material. Neither the figures of *Gnatholepis knightii* or *Gnatholepis samoensis* show any indication of the rows of minute papillae on the sides of the head. In my Hawaiian specimens there are at least 4 vertical rows of close-set pores of minute papillae extending down from lower eye edge to lower part of cheek, front one giving off forward branch to maxillary. Row also along mandible and another follows along preopercle ridge. These lines of pores seeming to define scale edges vertically and others present on opercle in similar vertical fashion. McCulloch and Ogilby (Australian Mus., Records, vol. 12, no. 10, p. 221, 1919) suggest *Gnatholepis* Bleeker and *Exyrias* Jordan and Seale as synonymous, but retain the latter as distinct on account of the cheek scales forming 3 distinct groups.

East Indies.

Gnatholepis puntang (Bleeker).

Gobius puntang Bleeker: Nat. Tijds. Ned. Ind., vol. 2, p. 486, 1851 (type loc., Rio, East Indies).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 29, 1885 (Rubi, New Guinea).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 139 (Majalibit Bay, Waigiu).

Exyrias puntang McCulloch and Ogilby: Australian Mus., Records, vol. 12, no. 10, p. 221, 1919 (type of *Gobius maculipinnis*).

Gobius maculipinnis Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 267, 1884 (type loc., Normanby Island in fresh water, D'Entrecasteaux Group).

Gobius puntangoides Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 171, pl. 108, fig. A; 1877 (Ponapé, Carolines).

Awaous puntangoides Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 84, 1906 (Shortland Island).

Head 3 2/5 to 3 1/2; depth 3 1/4 to 3 3/4; D. VI-1, 10, 1; A. I, 9, 1; P. 17; V. I, 5; scales 27 or 28 in median lateral series to caudal base and 3 or 4 more on latter; 9 or 10 scales transversely; 9 to 11 predorsal scales to middle of interorbital; snout 2 1/6 to 3 in head; eye 4 1/5 to 4 2/3; maxillary 2 1/2 to 2 3/4; interorbital 5 1/2 to 6 2/5.

Body well compressed, elongate, rather deep, greatest depth at anal origin. Caudal peduncle well compressed, length 7/8 its least depth, latter 1 2/3 to 1 4/5 in head.

Head compressed, cheeks swollen, upper profile evenly convex, more inclined than lower, width 1 1/3 to 1 2/3 its length. Snout convex, length 3/4 to 1 in its width. Eye elevated, hind pupil edge midway in head length. Maxillary reaches eye. Mouth inferior, broad, lower jaw included. Lips broad, thick, fleshy, edge of each with short fringe. Teeth fine, simple, conic, in bands in jaws. Tongue broad, depressed, edge free and rounded in front, surface smooth. Nostrils together, separated, front one at first 2/5 in snout. Interorbital narrow, level, constricted. Preopercle entire.

Gill opening extends forward opposite last fifth in head. Gill rakers 1 + 3, lanceolate, 2 1/2 in gill filaments, which 1 1/2 in eye. Pseudobranchiae 2/3 of gill filaments. Isthmus broad, slightly convex over surface, about equals snout as seen in profile.

Scales with 13 or 14 basal radiating striae, auxiliaries 4 or 5; apical denticles 62+75; circuli very fine. Scales large, narrowly imbricated, little smaller on breast, chest and sides of head. Cheek with 5 rows of scales below eye, of which upper 2 rows separated from others. Muzzle naked.

Spinous dorsal inserted opposite gill opening, spines flexible terminally, second to fifth ending in filaments; fourth spine 1 in head. Soft dorsal origin midway between eye center and caudal base, with last rays extended well beyond caudal base or scaly area on same; tenth ray 1 1/10 in head. Anal origin opposite that of second dorsal, fin similar; ninth ray 1 1/6 in head. Caudal long, median rays produced to point, 2 1/6 in combined head and trunk. Pectoral rounded, 3 1/4 in combined head and trunk. Ventral inserted opposite pectoral, reaches anal, 1 to 1 1/6 in head.

Color in alcohol dull brown generally, mottled with darker. Eight transverse irregular broken vertical bars, each obscurely double and broken. Dorsals and anal with many oblique dark brown lines. Caudal paler, barred obscurely with many fine close-set lines. Ventral disk dusky on hind rays. Iris slaty. Length 169 to 206 mm.

One in the Bishop Museum from Shortland Island. In the Agassiz Museum 1 from Ascension Island, obtained by Rev. A. A. Strong in 1879. It agrees in most respects with Day's figure, but does not belong in Bleeker's genus *Acentrogobius*.

Gobius maculipinnis Macleay is described as having 7 dorsal spines, possibly a variant, as most all the other characters are within the specific limits of the present form. The scaly cheek "with two impressed lines running from the maxillary backward for some distance" may refer to the rows of close set papillae, the arrangement of which is variable.

Andamans, East Indies, northeast Australia, Melanesia, Micronesia.

Kelloggella oligolepis (Jenkins).

Enypnias oligolepis Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 504, fig. 45, 1902 (1903) (type loc., Honolulu).—Snyder, op. cit., vol. 22, p. 536, 1902 (1904) (Honolulu).

Kelloggella oligolepis Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 488, fig. 215, 1903 (1905) (Waianae; Honolulu).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 147, 1912 (La Perouse Bay, Easter Island; type).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).

Enypnias desquamatus Brigham: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 2, p. 21, 1903 (1904) (type loc., Honolulu) (name only).

Head 4; depth 5 1/4 to 5 1/2; D. VI-12; A. 1, 6; snout 4 to 4 1/2 in head; eye 3 to 3 1/4; maxillary 2 1/4 to 2 1/3; interorbital 3 to 3 1/2. A microscopic examination of the skin does not disclose any scales. Head width 2 in its length; least depth of caudal peduncle 2 1/5; first dorsal spine 2; first dorsal ray 2 1/4; first anal ray 2 1/5; caudal 1; pectoral 1 1/8; ventral 1 2/5.

In the Academy 2 Hawaiian specimens 15 to 20 mm. The National Museum has the type of *Enypnias oligolepis*, 1 Hawaiian and 5 from La Perouse Bay on Easter Island. In the Agassiz Museum 6 from Easter Island.

Likely *Kelloggella* Jordan and Evermann may be merged with *Garmannia* Jordan and Evermann. As *Kelloggella cardinalis* Jordan and Seale was not described at the time the genus *Kelloggella* was first proposed, *Enypnias oligolepis* Jenkins virtually becomes the type.

Kelloggella cardinalis Jordan and Seale.

Kelloggella cardinalis Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 409, pl. 53, fig. 1, 1905 (1906) (type loc., Pago Pago, Samoa).

Differs from *Kelloggella oligolepis* in the clear green color, both dorsals, caudal and anal bright cherry red or orange bordered black. Paired fins green. Length 28 mm.

Vaimosa notospila (Günther).

Gobius notospilus Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 173, pl. 109, fig. B, 1877 (type loc., Namusi, Viti Levu).

Gobius petrophilus (non Bleeker) Schmeltz: Mus. Godeffroy, Cat. 4, p. 18, 1869 (Namusi).

Vaimosa fontinalis Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 395, fig. 85, 1905 (1906) (type loc., Apia [Vaisigano River and Vailima Brook, Gasegase River at Vaimosa, Pago Pago]).

Head 3 2/3; depth 4 1/5; D. VI-9; A. 8; scales 29, 8 transversely. Head broader than high, longer than broad. Snout very short and broad. Eye small, lateral, shorter than snout, 4 1/2 in head, 1 3/4 in interorbital. Mouth oblique, reaches below eye. No canines. Head naked, predorsal scales nearly reach interorbital; few scales on opercle. Last dorsal ray longest, twice first, nearly long as head. Anal similar. Caudal rounded. Pectoral 1 1/5 in head. Dark brown. Black blotch on posterior part of first dorsal. On first 3 membranes of soft dorsal medially black spot. Length 64 mm. (Günther)

Vaimosa javanica (Bleeker).

Gobius javanicus Bleeker: Nat. Tijds. Ned. Ind., vol. 11, p. 88, 1856 (type loc., Patjitan, south Java).—Weber: Nova Guinea, vol. 5, pt. 2, p. 260, 1908 (Mamåpiri and Klipong River, north New Guinea).—Weber: op. cit., vol. 9, pt. 4, p. 600, 1913 (Lorentz River at Alkmaar).

Head 5 in total; depth 5; D. VI-I, 8; A. I, 7; scales 27 or 28. Width and depth of head 3/4 its length. Eyes close together, more than 3 in head. Mouth cleft little oblique, mandible included. Maxillary reaches below front eye edge. Teeth in bands, outer row enlarged. Crown of head and opercles scaly. Dorsals lower than body, median spines of first longest. Caudal obtuse, rounded. Green, 3 deep violet spots each side of head. Most scales with brown spot. First dorsal with large round, posterior, black spot. Second dorsal and caudal brown-dotted. (Günther)

East Indies.

Callogobius hasseltii (Bleeker).

Eleotris hasseltii Bleeker: Nat. Tijds. Ned. Ind., vol. 1, p. 253, 1850 (type loc., Anjer, west Java).

Valenciennesia hasselti Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).

Callogobius hasseltii Weber: Nova Guinea, vol. 9, pt. 4, p. 601, 1913 (Humboldt Bay).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 142, 1913 (Saonek, Waigiu).—McCulloch and Ogilby: Australian Mus., Records, vol. 13, p. 217, 1919 (New Hebrides).

Head 5 in total; depth 7 1/2; D. VI-I, 9; A. I, 8; scales 45. Eye 3 1/2 in head; close together. Mouth cleft very oblique, mandible protruded. Maxillary nearly below front eye edge. Teeth in villiform bands, outer series rather larger. Preopercle without spine. Caudal pointed, 3 1/3 in total. Greenish-rose, marbled with brown. (Günther)

According to McCulloch and Ogilby differs from *C. sclateri* in the narrow basal membrane uniting the ventral spines, and the fifth rays though slightly shorter than the fourth united by a membrane to their tips.

East Indies, Melanesia.

Callogobius sclateri (Steindachner).

Eleotris sclateri Steindachner: Akad. Wiss. Wien, Sitz., vol. 80, pt. 1, p. 157, 1879 (1880) (type loc., Society Islands).

Gobiomorphus sclateri Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 384, fig. 73, 1905 (1906) (Apia; Pago Pago).

Callogobius sclateri McCulloch and Ogilby: Australian Mus., Records, vol. 13, p. 219, pl. 32, fig. 3, 1919 (New Hebrides; Solomons; Fiji).

Head 3 2/5; depth 4 3/5; D. VI-10; A. 9; scales 31, 13 transversely; snout 4 2/5, equals eye; interorbital 2 1/2 in eye, concave. Snout depressed. Mouth oblique, mandible protruded. Maxillary not quite to eye. Teeth in villiform bands, outer series enlarged. Tongue

rounded. Head with ridges of mucigerous papillae. Cheeks and opercles with large scales, usually hidden in thick mucous; scales strongly ctenoid, largest posteriorly on body. Ventrals without anterior basal membranes connecting spines, inner rays much shorter than others and connected by membrane only at extreme bases.

Light brown, with broad darker brown crossbands, 1 below each dorsal and 1 across caudal peduncle and with numerous irregular markings between. Crossbands extend on dorsals, breaking into irregular dark markings. Anal, caudal and pectorals with irregular dark crossbars, base of last with 2 darker stripes. Reaches 56 mm. (McCulloch and Ogilby)

In the National Museum 8 from Apia.

Queensland, Melanesia, Polynesia.

Chonophorus guamensis (Valenciennes).

Gobius guamensis Valenciennes: Hist. nat. Poiss., vol. 12, p. 77, 1837 (type loc., fresh waters of Guam).—Sauvage: Soc. Philom. Paris, Bull., p. 7, 1879 (Guam).—Elera: Cat. fauna Filipinas, vol. 1, p. 519, 1895 (Marianas).

Gobius stamineus Eydoux and Souleyet: Voyage "Bonite," Zool., vol. 1, p. 179, pl. 5, fig. 5, 1841 (type loc., Hawaiian islands).—Günther: Rept. voyage "Challenger," vol. 1, p. 59, 1880 (fresh waters of Honolulu; Hawaii).

Awaous stamineus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 502, 1902 (1903) (Honolulu; Hilo).—Snyder: op. cit., vol. 22, p. 536, 1902 (1904) (Anahulu River; Waimea; Hanalei; Hanapepe; Hulei River; Wailuki River).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 493, 1903 (1905) (Honolulu, Waialua, Hilo, Mauna Loa, Heneohe Creek, Kilihi Creek).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).

Chonophorus stamineus Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 79, Dec., 1922 (Hawaii).

Gobius crassilabris Günther: Cat. fishes Brit. Mus., vol. 3, p. 63, 1861 (type loc., Oualan; Aneiteum).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 18, 1869 (Namusi; Kanathia).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 178, pl. 108, fig. B, 1877 (Ovalu; Aneiteum).—Weber and Beaufort: Nova Caledonia (Sarasin and Roux), Zool., vol. 2, pt. 1, p. 37, 1915 (Bondé, tributary Didet; Tchalabel; Oubatche; Cone River; Tionaca River; between Coula and Boréare; Cui; Mont Canala; Coin de La Foa).

Awaous crassilabris Streets: U. S. Nat. Mus., Bull., no. 7, p. 59, 1877 (fresh waters of Oahu).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 517, 1900 (Hawaiian islands).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 84, 1906 (Shortland Island).

Trichopharynx crassilabris Ogilby: Linn. Soc. New South Wales, Proc., vol. 22, p. 769, 1891 (New Caledonia).

Head 3 to 3 2/3; depth 4 4/5 to 6; D. VI-1, 10, 1; A. 1, 9, 1 or 10, 1; scales 58 to 65 in median lateral series to caudal base and 2 to 4 more on latter; 16 or 17 scales transversely; 28 to 40 predorsal scales; snout 2 1/4 to 2 4/5 in head from snout tip; eye 4 2/5 to 8; maxillary 2 1/4 to 3; interorbital 1 to 1 1/2 in eye. Scales with 19 to 21 basal radiating striae; apical denticles 23 to 26 + 27, imbedded; circuli moderate. Pattern of porous lines on head as in *Chonophorus genivittatus*. The lines on the cheeks usually with a median horizontal divisional line.

In the Academy 9 from the Hawaiian islands of which 2 received through J. K. Townsend, and 4 from Hilo. Length 50 to 220 mm. The National Museum has 3 from Oahu, 1 Maui and 1 Hilo, all obtained by the Wilkes Expedition. Others are 4 from Oahu and 1 from Honolulu through T. H. Streets, also 115 Hawaiian specimens through the Bureau of Fisheries and a series from the Waimia River, Hawaii. Largest 260 mm. In the Bishop Museum 9 from Honolulu, and 3 from Haula Stream on July 3, 1914, through W. A. Bryan. In the Agassiz Museum 1 from Honolulu through W. H. Jones in 1874 and 4 from Maui through C. F. Winslow.

I have used *Gobius guamensis* Valenciennes as the oldest name for this species. The original account is condensed as follows:

Profile arched as in *Gobius ocellaris* but eyes remote as in *Gobius pallidus*. Form, small teeth in fine velvet, and number and arrangement of black marblings as in *Gobius ocellaris*. The marblings form frequently series more connected along middle of side. First dorsal gray, with brown spots, little marked upon rays, without black blotch. Second dorsal and caudal with pronounced streaks of *Gobius ocellaris*. Back and side gray-brown, lower surfaces and fins pale yellow. Length 166 mm.

Both *Gobius stamineus* Eydoux and Souleyet and *Gobius crassilabris* appear to be later synonyms.

Queensland, Melanesia, Micronesia, Polynesia, Hawaii.

Chonophorus ocellaris (Broussonet).

Gobius ocellaris Broussonet: Ichth., no pagination, pl., 1782 (type loc., fresh waters of Tahiti).—Bonnaterre: Tableau ichth., p. 65, pl. 36, fig. 142, 1788 (Tahiti).—Gmelin: Systema nat., Linné, p. 1204, 1789 (copied).—Valenciennes: Hist. nat. Poiss., vol. 12, p. 74, 1837 (Tahiti).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 18, 1869 (Viti Levu).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 177, pl. 108, fig. C, 1877 (Samoa; Rarotonga; Viti Levu).—Weber and Beaufort: New Caledonia (Sarasin and Roux), Zool., vol. 2, pt. 1, p. 38, 1915 (Tchalabel).

Awaous ocellaris Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 405, 1905 (1906) (Pago Pago; Apia).

Gobius punctatus (Solander) Valenciennes: Hist. nat. Poiss., p. 76, 1837 (name in text).

Apparently differs from *Chonophorus guamensis* in the cheeks and opercles largely scaled and a black blotch marginally and posteriorly on the spinous dorsal.

One in the National Museum from Pago Pago.

Fresh waters of Mauritius, Rodriguez, Melanesia and Polynesia.

Chonophorus genivittatus (Valenciennes) (Pl. XLII, *C*).

Gobius genivittatus Valenciennes: Hist. nat. Poiss., vol. 12, p. 48, 1837 (type loc., Tahiti).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 170, pl. 110, fig. C, 1877 (Tahiti; Fiji; Samoa; Hawaiian islands).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 14, 1877 (Raiatea).—Günther: Rept. voyage "Challenger," vol. 1, p. 44, 1880 (fresh waters at Api, New Hebrides).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 17, 1902 (Honolulu).—Weber and Beaufort: Nova Caledonia (Sarasin and Roux), Zool., 2nd ser., vol. 1, p. 37, 1915 (Tchalabel; Oubatche).

Kurtus genivittatus Schmeltz: Mus. Godeffroy, Cat. 4, p. 18, 1869 (Pelew Islands; Viti Levu).

Awaous genivittatus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 517, 1900 (Hawaii).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 502, 1902 (1903) (fresh waters of Honolulu).—Snyder: op. cit., p. 536, 1902 (1904) (Honolulu; Waiamea River; Hanapepe River; Hanalei River; Huleia River; Anahulu River).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 492, fig. 218, 1903 (1905) (Honolulu; Moanalua, Kaneohe Creek; Hilo).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 405, 1905 (1906) (Vaisigano River, Samoa).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 320, 1911 (Kusaie, Carolines).

Awaous vittatus Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii [lapsus for genivittatus]).

Chonophorus genivittatus Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 78, Dec., 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 30, 1925 (Honolulu).

Head 3 1/4 to 3 1/2; depth 4 1/8 to 4 4/5; D. VI-1, 11, 1; A. 1, 10, 1 to 12, 1; scales 48 to 50 in median lateral series to caudal base and 3 or 4 more on latter; 12 or 13 scales transversely; 17 to 20 predorsal scales; snout 2 7/8 to 3 in head; eye 5 3/4 to 6 3/4; maxillary 1 4/5 to 3; interorbital 5 3/5 to 7.

Scales with 14 or 15 basal radiating striae; apical denticles 39 to 43; circuli moderate. Cheek with 4 rows of pores below eye, front one forking below. Bar of pores close below nostrils, another vertically before front nostril. Line of pores close behind eye above, when midway in eye-diameter extended horizontally backward. Another line each side of mandible and along lower preopercle edge, continued up closely parallel with and along preopercle flange. Vertical line of pores on opercle extends down and forward to preopercle. Length 73 and 180 mm.

In the Academy 10 Hawaiian specimens, of which 6 through J. K. Townsend. The Bishop Museum has 27 from Honolulu; 77 from Laie Stream on Oahu through C. Montague Cooke, Jr. and III, on November 5, 1922; 1 from Waialua Stream on Molokai on June 29, 1914, through W. A. Bryan. I found 400 specimens in the Honolulu markets during November and December, 1922. In the Agassiz Museum 8 Hawaiian specimens, 5 from the Society Islands through Andrew Garrett and 1 from Kusaie, through Rev. B. G. Snow. The National Museum has 1 from Maui and 4 from Oahu, obtained by the Wilkes Expedition. Also 136 Hawaiian specimens through the Bureau of Fisheries, as 2 from Honolulu, 2 Hanapepe River, 1 Kusaie and 2 Apia.

Melanesia, Micronesia, Polynesia, Hawaii.

Chonophorus beauforti (Weber).

Gobius beauforti Weber: Nova Guinea, vol. 5, pt. 2. p. 261, 1908 (type loc., Mamåpiri and Klipong River, north New Guinea).

Head 4 1/2 in total; depth 6; D. VI-I, 11; A. I, 11; scales 48 to 50, 10 or 11 transversely. Eye 3 2/3 in head, little longer than snout, close together. Mouth cleft short, not quite to eye. Teeth fine, no canines. Scales ctenoid, 16 predorsal cycloid. Head naked. Dorsal and anal lower than body depth. Yellowish, with 7 or 8 short, vertical crossbands on side of trunk and tail. Black band through eye somewhat broader than pupil, slanting downward. First dorsal with single and second dorsal with double row of dark spots. Caudal hyaline, shorter than head. Anal like caudal, with submarginal violet longitudinal band. Length 48 mm. (Weber)

Chonophorus melanocephalus (Bleeker).

Gobius melanocephalus Bleeker: Bataviaasch Genoot., Verh. (Blenn. Gobioid.), vol. 22, p. 33, 1849 (type loc., Bogowonto River, Purworedjo).—Weber: Nova Guinea, vol. 9, pt. 4, p. 599, 1913 (Umbai River mouth).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 139, 1913 (Rabiai River, Waigiu, fresh water).

Gobius grammepomus Pellegrin: Mus. Hist. Nat. Paris, Bull., 4, p. 229, 1898 (Mariannes).

Head 3 1/3; depth 4 1/4; D. VI-I, 10; A. I, 10; scales 55, 14 transversely; snout 2 3/4 in head; eye 4 1/4, 1 1/2 in snout, nearly equals interorbital. Head long as wide. Mouth cleft slightly oblique, upper jaw slightly longer. Maxillary reaches below front eye edge. Teeth above in several fixed rows, outer longer; many lower villiform rows, outer fine, rather elongated and slightly horizontal. Scales ctenoid; predorsal 22, far as eye; few scales on opercles above; body scales angular. No papillae on head. Dorsal spines weak, filamentous ends high as body and equal last dorsal rays, which reach caudal base. Caudal nearly truncate, 1 2/3 in head; pectoral 1 1/5; ventral 1 1/2.

Light brown, darkest along back and head above. Black spot at upper angle of opercle. Head and upper 2/3 of body with numerous vermiculated black lines and spots. Dorsal with 3 or 4 rows of spots forming bars, sometimes dark mark on outer half of fin from fifth spine to fin end. Outer anal edge white. Caudal with 5 or 6 angular bars or irregularly placed spots. Length 86 mm. (Day)

India, Andamans, East Indies, Philippines, Micronesia.

Rhinogobius nebulosus (Forskål).

Gobius nebulosus Forskål: Descriptiones animalium, pp. x, 24, 1775 (type loc., Djedda, Red Sea).

Rhinogobius nebulosus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 401, 1905 (1906) (Vaisigano River at Apia).—McCulloch and Ogilby: Australian Mus., Records, vol 13, p. 245, 1919 (New Hebrides).

Gobius criniger Valenciennes: Hist. nat. Poiss., vol. 12, p. 62, 1837 (type loc., Doreh Harbor, New Guinea; Malabar).[—Günther: Cat. fishes Brit. Mus., vol. 3, p. 29, 1861 (Madras, Pinang Sea, Northwest Australia, Port Essington)].—Schmeltz: Mus. Godeffroy, Cat. 6, p. 14, 1877 (South Sea).

Coryphopterus criniger Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 84, 1906 (Raiatea).

Gobius brevifilis Schmeltz: Mus. Godeffroy, Cat. 6, p. 14, 1877 (Pelew Islands).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 176, pl. 108, fig. 3, 1877 (Pelew Islands).

Rhinogobius corallinus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 400, fig. 89, 1905 (1906) (type loc., Pago Pago, Samoa).

Head 3 1/8 to 3 1/4; depth 4 1/2; D. VI-I, 9, 1; A. I, 9, 1; scales 29 or 30 in median lateral series to caudal base and 3 more on latter; 13 or 14 scales transversely; 7 or 8 imbedded predorsal scales; snout 3 to 3 1/10 in head; eye 3 1/10 to 3 1/8; maxillary 2 1/2 to 2 2/3; interorbital 7.

Body elongate, well compressed, deepest at soft dorsal origin. Caudal peduncle well compressed, least depth 1 1/5 to 2 3/4 in its length or 2 1/3 in head.

Head width 1 3/5 in its length. Snout convex, obtuse, length 3/4 its width. Eye large, hind pupil edge midway in head length; diameter equals snout length. Mouth large, jaws equal. Maxillary reaches front eye edge. Teeth small, in narrow bands in jaws, outer

series slightly enlarged. Tongue broadly convex in front. Front nostril at last 2/5 in snout; hind nostril little larger, closer to front one than to eye. Interorbital narrow, level.

Gill opening 3 in head. Gill rakers 4 + 6, lanceolate, 1 1/4 in gill filaments, which 2 1/3 in eye.

Scales with 19 or 20 basal radiating striae; apical denticles 16 or 17 + 13 to 16; circuli minute. Cheek with 3 horizontal rows of minute pores of which 2 lower double rows; row from behind eye to suprascapula; row across opercle, along preopercle flange and forward on under mandibular face. Predorsal naked. Second dorsal spine terminally filamentous, 1 1/8 to 1 1/4 in head; first dorsal ray 1 7/8; fourth anal ray 2 2/5; caudal rounded, 1; pectoral 1 1/5 to 1 1/4; ventral 1 1/5 to 1 1/2.

Brown, little paler on under surface of head and belly. Middle of side with 3 large rounded dusky-brown blotches, each little larger than eye and last at caudal base. Back mottled with darker brown than body color and dusky-brown blotch at base of spinous dorsal posteriorly or before soft dorsal. Fins pale, spinous dorsal with 2 or 3 dusky blotches on each spine and soft dorsal with 3 or 4 longitudinal dusky-brown bands. Caudal with several dark transverse bands basally. Anal with lower edge dusky. Paired fins pale. Length 81 mm.

In the Agassiz Museum 1 from the Pelew Islands obtained by R. Torrey in 1862. In the Bishop Museum 1 from Faté and 1 from Raiatea. Length 50 to 116 mm. The National Museum has 1 from Apia.

Gobius circumspectus Macleay suggests this species. It is described with the muzzle rounded, mandible protruded, scales 30, second dorsal spine terminally filamentous, greenish-yellow with indistinct darker markings, dorsal and caudal brown spotted and large diffuse brown spot at caudal base.

Red Sea, Zanzibar, Madagascar, India, East Indies, West Australia, North Australia, Queensland, Melanesia, Micronesia, Polynesia.

Rhinogobius neophytus (Günther).

Gobius neophytus Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 174, pl. 108, fig. E, 1877 (type loc., Ponapé; Apia; Huahine; Tahiti).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 14, 1877 (Raiatea).—Boulenger: Ann. Mag. Nat. Hist., London, 6th ser., vol. 20, p. 373. 1897 (Rotuma).

Rhinogobius neophytus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 400, 1905 (1906) (Pago Pago; Apia).

Rhinogobius muscarum Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 401, fig. 90, 1905 (1906) (type loc., Pago Pago).

Head 3; depth 4; D. VI-10; A. 9; scales 23, 6 transversely. Snout pointed. Eye 3 1/2 in head, 1 1/5 in snout, close together. Mouth nearly horizontal, lower jaw little protruded. Maxillary not quite reaching opposite eye. No canines. Vertical fins moderately high. Caudal round, long as head. Colorless, mottled with brown and white on head and body above. Usually larger round blotch at caudal base. Sometimes black spot between first 2 dorsal spines. Lower fins white. Length 51 mm. (Günther)

In the National Museum 2 from Apia.

Rhinogobius muscarum is based on a specimen but 17 mm. long and is apparently the young.

Rhinogobius scapulopunctatus (Beaufort).

Gobius (Rhinogobius) scapulopunctatus Beaufort: Zool. Anzeiger, vol. 30, p. 137, 1912 (type loc., Saonek, Waigiu).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 140, fig. 5, 1913 (Saonek).

Head 3 1/3; depth 4 1/3; D. VI-I, 8; A. 8; scales 27, transversely 8; eye 2 1/2 to 3, greater than snout, very close together; maxillary reaches eye; tongue truncate, front edge slightly concave; outer row of teeth enlarged; scales slightly smaller on body anteriorly; side of head and opercles naked; crown of head covered by large scales, partly imbedded; median first dorsal rays prolonged, higher than body, lower than body depth in female; caudal rounded; pectoral rays branched. Whitish, with 5 saddle-like brown bands on back; dark brown patch below eye and indistinct stripe forward to mouth; brown patches on sides and under surface of head; 3 or 4 black spots above pectoral origin; black spot at dorsal side and in middle of tail at caudal base; first dorsal with 2 indistinct black bands; second dorsal and anal with black spots forming dark bands in fins; paired fins and anal dusky, darker in male. Length 24 mm. (Beaufort)

Drombus filamentosus (Sauvage).

Gobius filamentosus Sauvage: Soc. Philom. Paris, Bull., 7th ser., vol. 7, p. 157, 1882 (type loc., New Caledonia).

Head 4 2/3; depth 6; D. VI, 10; A. I, 9; scales 32, 11 transversely. Head little broader than deep. Snout obtuse, longer than eye, which 3 1/2 in head; eyes close together. Maxillary reaches eye. No canines; median mandibular teeth longer than others. Head naked, lines of pores mark jaws. Filaments very fine and numerous at throat, on head below and front of body. Caudal rounded. Upper pectoral rays not silky. Yellowish, with 7 vertical more or less regular brown bands. Small clear spot on border of each scale. Head slaty, with small spots. First dorsal clouded brown, also second dorsal and caudal. Pectoral base violaceus. Length 70 mm. (Sauvage)

Drombus tutuilae Jordan and Seale.

Drombus tutuilae Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 399, fig. 88, 1905 (1906) (type loc., Pago Pago).

Head 2 3/4; depth 4 1/2; D. VI, 8; A. 8; scales 23; snout 4 1/5 in head; eye 3 1/2. Body compressed. Mandible protrudes. Maxillary not quite to eye. Minute teeth in jaws, none on vomer or palatines. Head roughened with numerous raised lines of rather large size which radiate from eye; others cross cheek, snout and nuchal region. Third dorsal spine 1 7/8 in head, first branched ray 1 3/4; sixth anal ray 2; caudal peduncle depth 2 3/5; caudal convex behind; pectoral 1 1/6; ventral 1 2/5.

Yellowish-white with 5 rather distinct vertical black bands. Dusky blotch on nuchal region just back of eye and top of head more or less dusky. Fins slightly darker than body, dark body bands more or less extending on dorsals. Length 19 mm. (Jordan and Seale)

Possibly the young of *Drombus filamentosus* (Sauvage).

Vailima stevensoni Jordan and Seale.

Vailima stevensoni Jordan and Seale: (U. S.) Bull. Bur. Fish., Bull., vol. 25, p. 398, fig. 87, 1905 (1906) (type loc., Gasegase River at Vaimosa, Samoa).—Kendall and Goldsborough, Mus. Comp. Zool., Mem., vol. 26, p. 319, 1911 (Tipaerni Valley, Papeete, Society Islands).

Head 4 3/4; depth 5 2/5; scales 34, 8 transversely; snout 3 3/4 in head; eye 4 1/4, 1 1/5 in snout; interorbital 3 1/5 in head, concave. Head rounded in front. Mouth rather small, reaches front eye edge. Lips broad.

Row of small pointed teeth in jaws, none on palate. Head scaled above only. Fourth dorsal spine 3 3/4 in combined head and body; caudal 3 2/3, rounded; pectoral 4 1/4; ventrals 1 1/4 in head.

Olive-green, scales mottled golden and black. Head with olive lateral band. Black lateral band, interrupted by grayish spots. First dorsal cherry-red, spines with black spots. Second dorsal reddish, with dark checkers. Caudal yellow above, then median red dash and lower half yellowish; all but upper edge closely reticulated dark around pale spots. Anal dark. Pectoral yellow, checked black. Length 51 mm. (Jordan and Seale)

In the National Museum 1 from the Tipaerni Valley, Papeete.

Ctenogobius atriclypeus (Garman).

Gobius atriclypeus Garman: Mus. Comp. Zool., Bull., vol. 39, p. 233, pl. 2, fig. 1, 1903 (type loc., Bay of Moala, East Fiji, in 25 fathoms).

Head 3 1/6; depth 5 2/5; D. VI-12;[1] A. 12; scales 25, 10 transversely; snout 4 4/5 in head from snout tip; eye 3; maxillary 2 3/4. Snout short, subtruncate as seen above. Mouth wide, oblique. Maxillary extends to 1/3 of eye. Teeth small, in bands, 1 or 2 canines each side above and below. Interorbital very narrow. Scales large, ctenoid, with minute teeth. Second dorsal spine 2 1/2 in total head, ninth ray 1 1/2; fifth anal ray 2 1/2; caudal peduncle depth 2 7/8; ventral 1 1/5; caudal ends in median point, 2 2/3 in combined head and body; pectoral 3. Light brownish, fins darker. Series of small brown spots along middle of flank from cheek to black spot on base of caudal. Ventrals black. (Garman)

Oplopomus oplopomus (Valenciennes).

Gobius oplopomus Valenciennes: Hist. nat. Poiss., vol. 12, p. 50, 1837 (type loc., Massaua, Red Sea).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 170, pl. 110, fig. B, 1877 (Tahiti; Maiao Island).

Oplopomus oplopomus Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 317, 1911 (Moen, Truk Group, Carolines).

Head 3 3/5 to 3 3/4; depth 4 1/2 to 4 3/4; D. VI-I, 10, 1; A. I, 10, 1; scales 26 in median lateral series to caudal base and 4 more on latter; 7 scales transversely, 8 predorsal; snout 3 3/4 to 4 in head measured from upper jaw tip; eye 3 1/4; maxillary 2 1/4 to 2 2/5; interorbital 3 4/5 to 5 in eye.

Body elongate, moderately deep, compressed. Caudal peduncle well compressed, least depth 1 1/4 to 1 2/3 in its length or 2 1/6 to 2 2/3 in total head length.

Head width 2 1/6 to 2 1/5 in its length. Snout short, obtuse, length 2/3 to 3/4 its width. Eye with hind pupil edge about midway in head length; diameter greater than snout and greatly more than interorbital. Mouth moderate, oblique, extends to front pupil edge. Teeth small, simple, conic, in 4 or 5 rows in jaws and outer row enlarged with last median lower lateral slightly enlarged curved canine. Tongue broadly convex, entire in front. Front nostril at last 2/5 in snout; hind nostril close before front eye edge, larger and much nearer eye than front nostril. Interorbital very narrow, slightly concave. Hind preopercle edge with denticle above angle, which somewhat as broad spine.

Gill rakers 2 + 6, lanceolate, 1 1/5 in gill filaments, which 2 in eye. Scales with 21 or 22 basal radiating striae; apical denticles 24 to 30 + 24 to 26; circuli fine. First dorsal spine strong, robust, 2 2/5 to 2 2/3 in entire head; third dorsal spine 3 to 3 3/5 in combined head and trunk; spine of soft dorsal robust, strong, 2 2/5 to 2 3/4; ninth anal ray 1 1/3 to 1 2/5; caudal pointed behind, 3 1/4 to 3 1/3 in combined head and trunk; pectoral 1 1/10 to 1 1/4 in head; ventral 3 1/8 to 3 2/3 in combined head and trunk.

[1] Figure shows D. IX-13, A 13, scales 29, 7 transversely!

Faded largely dull brownish, whitish on under surface of head, breast and belly. Spinous dorsal marbled brown, filaments all dusky terminally. Scales on body each with 1 or 2 round blue-gray spots. Soft dorsal with blue-gray spots in membranes crowded basally. Anal whitish, with median grayish longitudinal band. Blue-gray spots on opercle and several similar bars on cheek, snout, pectoral base and each side of occiput. Ventrals brownish terminally. Pectorals and caudal pale. Length 65 to 70 mm.

In the Agassiz Museum 2 from the Society Islands, obtained by Andrew Garrett. One in the National Museum from Truk.

Red Sea, East Indies, Philippines, Micronesia, Polynesia.

Aboma ocellata (Kner).

Gobius petrophilus var. *ocellata* Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, p. 326, 1868 (type loc., Viti Levu, Fiji).

Gobius graeffii Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 179, 1877 (type loc., fresh waters of Namusi [Viti Levu, Fiji]).

Head 3 1/2; depth 5; D. VII-10; A. 7; scales 32, 11 between dorsal and anal origin. Head moderately flat below. Snout longer than eye. Eye moderately large, not very close together. Mouth oblique, reaching eye. Side of head naked. Neck with small scales reaching eye. Dorsal low. Caudal rounded. Ventral nearly reaches vent, with wide funnel membrane. Nearly uniform, with obscure marblings and blotches on fins. Length 51 mm. (Günther)

Fresh waters of Fiji. Kner's specific name, though employed simply as varietal, has priority over the later *Gobius graeffii* Günther.

Amblygobius sphynx (Valenciennes).

Gobius sphynx Valenciennes: Hist. nat. Poiss., vol. 12, p. 70, 1839 (type loc., New Guinea).

Amblygobius sphinx Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 321, 1911 (Moen, Truk Group, Carolines).

Head 4 1/2 in total; depth 4 1/4; D. VI-I, 14; A. I, 14; lateral line 53; 18 scales between second dorsal and anal. Head compressed, higher than wide. Snout obtuse, somewhat longer than eye. Lower jaw with small canine each side. Interorbital flat, scaleless, width half of eye. Dorsals close together, lower than body; distance of first from eye rather more than that of snout from preopercle. Pectoral rays not silk-like. Ventral not reaching vent, basal membrane moderate.

Body with 4 or 5 brownish crossbands. Belly rose-colored with about 12 blue crossstreaks. Head with numerous blue, darker-edged spots. Gill membrane with brown crossbar. First dorsal clouded violet and dotted blue, like second and caudal. Anal and ventral rose, with black edges, former posteriorly dotted blue, latter entrely. (Günther)

The type was 89 mm. long. One in the National Museum from Moen.

East Indies, Micronesia.

Amblygobius phalaena (Valenciennes).

Gobius phalaena Valenciennes: Hist. nat. Poiss., vol. 12, p. 70, 1837 (type loc., Vanicolo).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 178, pl. 111, fig. C, 1877 (Pelew Islands; Apia; Samoa; Society Islands).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 14, 1877 (Raiatea).—Günther: Rept. voyage "Challenger," vol. 1, p. 35, 1880 (Ovalau, Fiji).

Odontogobius phalaena Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 84, 1906 (Faté).

Amblygobius phalaena Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 405, 1905 (1906) (Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 321, 1911 (Vavau, Fiji).—McCulloch and Ogilby: Australian Mus., Records, vol. 13, p. 235, pl. 35, fig. 1, 1919 (New Hebrides).—Fowler: B. P. Bishop Mus., Bull. 22, p. 17, 1925 (Guam).

Gobius oligolepis (non Bleeker) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 84, 1906 (Faté).

Head 3 1/3; depth 3; D. VI-I, 14, 1; A. I, 14, 1; scales 52 in median lateral series to caudal base and 8 more on latter; scales 21 transversely, 23 predorsal; snout 3 2/5 in head; eye 4; maxillary 2 1/4; interorbital 4 1/6.

Body elongately ovoid, compressed, rather deep. Caudal peduncle strongly compressed, length 3/4 its least depth, which 2 1/8 in head. Head width 2 in its length. Snout convex, length 2/3 its width. Eye large, hind edge midway in head length; diameter 1 1/5 in snout; equals interorbital. Mouth moderate, jaws robust, lower slightly shorter. Maxillary reaches front pupil edge. Teeth rather large, conic, in bands in jaws and outer row rather large, especially anterolaterals, of which last curved. Tongue obtuse, rounded in front. Front nostril midway in snout; hind nostril midway between front nostril and eye. Interorbital broadly convex. Lips fleshy. Gill rakers 0 + 5, lanceolate, rather flexible, 1 1/3 in gill filaments, which 1 2/3 in eye. Scales with 20 or 21 basal radiating striae; apical denticles 25 to 30; circuli fine. Head largely naked, except upper part of cranium forward to middle of interorbital and upper part of opercles. Row of fine papillae along preorbital and close along lower and hind edges of eye, giving 6 short branches down below eye; postocular row back to suprascapula; row along preopercle edge and forward on lower face of each mandibular ramus; row horizontally from above maxillary back across cheek. Fourth dorsal spine 1 1/10 in head; fourth dorsal ray 1 3/4; fourth anal ray 1 3/4; pectoral 1; ventral 1; caudal pointed behind, 2 4/5 in combined head and trunk.

Body dull brown, becoming pale on under surface. On trunk and tail 6 transverse dark vertical bands. Cheek with scattered pale spots. Spinous dorsal dusky terminally and soft dorsal with median longitudinal dusky band. Anal with edge brownish and some small scattered gray spots posteriorly terminally. Caudal pale brown and hind edge dusky and blackish blotch on rays above and another below subterminally. Pectoral pale. Ventral deep brownish. Length 73 mm.

In the Agassiz Museum 1 from the Pelew Islands, obtained by R. Torrey in 1862. Also 2 from the Society Islands, secured by Andrew Garrett. The Bishop Museum has 4 from Faté, 55 to 117 mm. Also 9 from Guam in 1923. In the National Museum 4 from Apia and 1 from Vavau.

East Indies, West Australia, Queensland, Melanesia, Micronesia, Polynesia.

Amblygobius semicinctus (Bennett).

Gobius semicinctus Bennett: Zool. Soc. London, Proc., vol. 1, p. 32, 1833 (type loc.. Mauritius).—Günther: Cat. fishes Brit. Mus., vol. 4, p. 68, 1861 (type).—Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, p. 326, 1868 (Kanathia, Oualan, Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 18, 1869 (Kanathia).

Head 5 in total; depth 4 3/4; D. VI-I, 15; A. I, 14; lateral line 55, 18 scales transversely at soft dorsal and anal origin. Head rather compressed, higher than wide. Snout obtuse, scarcely longer than eye, which equals interorbital. Jaws equal. Maxillary not quite to eye center. Mandible with small canine each side. Interorbital naked. Scales on neck much smaller than on body. Dorsals close together, second, third and fourth spines elongate, filiform, higher than body; distance of first dorsal from eye more than that of snout from preopercle. None of pectoral rays silklike. Ventral with basal membrane moderately developed, extends to vent.

Greenish-olive in spirits, with some very indistinct darker bands across back. Lower side yellowish, with 6 silvery crossbands edged with black, broad as interspaces of ground-color between, ascending far as middle of side; first between pectoral and ventral bases, last 2 above front half of anal. Shoulder with round brownish spot. Head reddish-olive, sides with rather irregular, small, round silvery spots edged brown. First dorsal with large violet spot in middle and with numerous small ocelli; second dorsal with longitudinal series of violet dots, more distinct on fin base than superiorly. Caudal with blackish edge and round blackish superobasal spot. Anal with numerous small basal ocelli. Pectoral uniform. Ventral white, margin blackish. Length 123 mm. (Günther)

Mauritius, Polynesia.

Amblygobius papuanus (Peters).

Gobius papuanus Peters: Akad. Wiss. Berlin, Monatsb., p. 839, 1876 (1877) (type loc., MacCluers Bay, New Guinea).

Head 4 in total; depth 6 1/2; D. VI-I, 10; A. I, 9; scales very small, somewhat larger on caudal; snout convex, blunt, little shorter than eye, which 4 in head and very narrowly separated from one another; jaws equally wide and prominent; mouth cleft slightly oblique, extends behind eye; teeth in narrow bands, at front and anteriorly each side of mandible 1 or 2 strong canines; opercle rounded, without spine. Head scaled. Dorsal rays shorter than body depth. Second dorsal and anal nearly opposite. Caudal pointed. Ventral shorter than head.

Yellowish-green speckled brown. Brown band from eye to hind end of upper jaw. On back small, round, clear, dark-edged spots. On body 4 transverse crossbands; first from neck posteriorly extends with brown tint over part of gill covers; second from dorsal spines; third and fourth from soft dorsal. Spinous dorsal medianly, before tip and hind rays black. Second dorsal white at base and margin, medially black. Anal broadly edged black. Middle of caudal base with round spot and posterior half of fin blackish. Ventral with small round spot near front part basally. Length 50 mm. (Peters)

Cryptocentrus cyanotaenia (Bleeker).

Gobius cyanotaenia Bleeker: Nat. Tijds. Ned. Ind., vol. 4, p. 475, 1853 (type loc., Batavia, Java).

Gobius (Cryptocentrus) cyanotaenia Weber: Siboga Exped., vol. 65, p. 475, 1913 (near New Guinea in S. Lat. 1° 42.5′, E. Long. 130° 47.5′ in 32 m.).

Head 4 1/2 in total; depth 7 1/4; D. VI, I, 10; A. I, 10; scales 100. Head deeper than wide. Snout obtuse, convex, shorter than eyes, which prominent, close together, 5 in head. Mouth cleft oblique, mandible produced. Outer teeth enlarged; no canines. Head naked; anterior scales of body smaller than posterior. First dorsal somewhat higher than second, but lower than body. Caudal rounded. Pectoral without silk-like rays. Greenish rose-colored, with 4 broad brownish crossbands and 11 blue transverse stripes. Sides of head with oblique blue streaks. Dorsals, caudal and ventrals immaculate. Anal yellow, with violet edge and 3 reddish-violet blue-edged longitudinal bands. Pectoral base dotted with blue. (Günther)

East Indies.

Cryptocentrus leucostictus (Günther).

Gobius leucostictus Günther: Zool. Soc. London, Proc., p. 664, pl. 63, fig. C, 1871 (type loc., Tonga Islands).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 176, pl. 108, fig. F, 1877 (type).

Head 4; depth 5; D. VI, 12; A. 11. Head rather compressed. Snout very short, obtuse. Eyes very close together, obliquely directed upwards, 5 in head. Mouth oblique, reaches below middle of eye; jaws even. Head and foremost part of trunk scaleless. Dorsal and anal lower than body. Caudal somewhat pointed, longer than head. Pectoral reaches opposite end of spinous dorsal. Ventral shorter, ends far from vent. Grayish, with irregular dark crossbars on back. Sides and lower parts with small round whitish spots and dots. Dorsals with black spots in oblique series. Anal with black spots confluent across interradial membrane, forming oblique bands. Caudal with 6 black crossbands. Ventral with black and white spots. Length 68 mm. (Günther)

Cryptocentrus stigmatophorus (Beaufort).

Gobius (*Cryptocentrus*) *stgmatophorus* Beaufort: Zool. Anzieger, vol. 39, p. 136, 1912 (type loc., Saonek, Waigiu).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 141, 1913 (type).

Head over 3; depth 5; D. VI, 12; A. 13; P. 16; scales 80, transversely 20; eye 3 2/3 in head, longer than snout, very close together; 8 canines each side above and 5 or 6 each side below; scales ctenoid, larger on tail; head naked, scales begin just before dorsal fin; third dorsal ray longest, 4/5 of body height; second dorsal not over twice first dorsal and little more than anal; caudal obtusely pointed, 1/5 total length. Gray brown, 14 vertical narrow light bands on body. Cheeks and opercles spotted with light blue ocelli, surrounded by deeper blue. Most body scales with blue vertical stripe. Also black spots on side of head and body. Some larger spots behind eye and hind opercle edge, where confluent and form conspicuous dark patch. Black band crosses basal portion of first dorsal; 3 rows of black spots on second dorsal. Anal with submarginal dusky band and dark spot at bases between each ray. Caudal with 5 dark bars. Pectoral dusky at base. Ventral with dusky pigment. Length 31 mm. (Beaufort)

Cryptocentrus strigilliceps (Jordan and Seale).

Mars strigilliceps Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 408, fig. 95, 1905 (1906) (type loc., Apia).

Head 3 1/4; depth 4 2/5; D. VI-I, 10, 1; A. I, 9, 1; scales 65; snout 4 2/5 in head; eye 4 3/5. Front profile rounded. Mouth rather large, jaws equal. Maxillary reaches below eye center. Several rows of small sharp-pointed teeth in jaws; 2 or 3 rather large blunt teeth on vomer, also palatines; tongue toothless. Head scaleless, with numerous small pores, each with minute filament. About 6 rows of papillae radiate from eye and extend across cheek and crossed by 3 or 4 other rows. Second dorsal spine 1 in head; third ray 1 1/2; last anal ray 1 1/2; caudal peduncle depth 2 2/3; caudal 1 1/3; pectoral 1 2/5; ventral 1 2/5.

Dark olive, with 4 narrow rather obscure grayish crossbands. Front of head dusky, lower part bronze-olive, with 6 contrasted irregular white crossbands. Similar fainter crossbands on belly. White bar from spinous dorsal front crossing pectoral base and forming ring about body. Fins dusky-olive, with no clear markings. Pectoral base with white marblings. Length 51 mm. (Jordan and Seale)

Mars is here used as a subgenus of *Cryptocentrus*, and evidently the teeth on the palate in combination with its small scales are its distinctive features.

Vitraria clarescens Jordan and Evermann.

Vitraria clarescens Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 205, 1902 (1903) (type loc., Hilo).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 486, pl. 60, 1903 (1905) (Hilo).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 27, 1925 (Lisiansky Island and Pearl and Hermes Reef).—Fowler: op. cit., Bull. 38, p. 29, 1927 (Tongareva).

Head 4; depth 7; D. VII-10?; A. 9; scales 55 in median lateral series to caudal base and 3 more on latter; 13 scales transversely; snout 3 1/3 in head; eye 4; maxillary 2 4/5; interorbital 3 1/8. Least depth of caudal peduncle 2 in head. Head width 2 in its length; second dorsal spine 2 1/8; first branched dorsal ray 1 1/2; first branched anal ray 1 7/8; pectoral 1 1/2; ventral 1 3/4. Length 25 to 27 mm.

In the Bishop Museum 1 from Honolulu and 1 from Hilo. Also 2 from Lisiansky and 4 from Pearl and Hermes Reef. In the National Museum the type of *Vitraria clarescens*.

Chaenogobius erythrops Jordan and Seale.

Chaenogobius erythrops Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 404, pl. 37, fig. 3, 1905 (1906) (type loc., Pago Pago, Samoa).

Head 3; depth 5 1/2; D. VI-9; A. 7; scales 41; snout 3 2/5 in head from snout tip; eye 3; maxillary 2 3/4. Body compressed, caudal peduncle depth 4 in total head length. Maxillary reaches little beyond front of eye. Teeth uniserial, some enlarged anteriorly; vomer toothed, none on palatines. Tongue notched at tip. Opercle and preopercle entire. Longest (third) dorsal spine 2 1/5 in head, second ray 2 1/5; second anal ray 3; caudal 1 3/5, rounded; pectoral 1 2/3 (upper 5 rays not connected except on basal half); ventral 1 4/5, fins united. Pearly-white, sides darker and with black points. Eye rosy around pupil. Rosy longitudinal preocular bars. Length 14 mm. (Jordan and Seale).

Only known from the type in the National Museum.

Zonogobius semidoliatus (Valenciennes).

Gobius semidoliatus Valenciennes: Hist. nat. Poiss., vol. 12, p. 51, 1837 (type loc., Vanicolo).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 28, 1870 (Samoa; Tonga).—Schmeltz: op. cit.. Cat. 6, p. 14, 1877 (Huahine).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 174, pl. 109, fig. H, 1877 (Huahine; Society Islands; Samoa).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 139, 1913 (Saonek, Waigiu).

Zonogobius semidoliatus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 397, fig. 86, 1905 (1906) (Apia; Pago Pago).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 319, 1911 (Borabora, Society Islands).—Fowler: B. P. Bishop Mus., Bull. 38, p. 29, 1927 (Howland Island).

Gobius semifasciatus Kner: Akad. Wiss. Wien, Sitz., vol. 58, p. 326, pl. 5, fig. 15, 1868 (type loc., Samoan islands).

Head 2 1/2 to 2 7/8; depth 3 to 3 1/2; D. VI-I, 9; A. I, 9; scales 22 to 25 in median lateral series to caudal base and 3 more on latter; 10 scales transversely; snout 3 2/3 to 4 in head measured from upper jaw tip; eye 2 4/5 to 3; maxillary 2 to 2 1/8; interorbital 2 1/2 to 2 3/4 in eye.

Body compressed, moderately long, deepest at soft dorsal origin. Caudal peduncle compressed, least depth equals its length or 2 in total head length.

Head width 1 3/4 in its length. Snout conic, length 2/3 its width. Eye large, superolateral, hind pupil edge slightly before middle in head length; diameter much greater than snout. Mouth moderate, obliquely vertical, mandible protruding. Maxillary reaches opposite front pupil edge. Teeth biserial in jaws, rows widely spaced; upper with inner row short and teeth much smaller; lower with inner row much larger and extending all round jaw, outer row only anterior. Tongue with front edge convex. Nostrils small, front one midway between snout tip and eye. Interorbital narrow.

Gill rakers 3 + 10, lanceolate, half of gill filaments, which 3 in eye.

Scales with 12 or 13 basal radiating striae; apical denticles 16 to 21; circuli moderate. On cheek 2 short horizontal rows of minute, close-set papillae; row along preopercle flange and then forward upon under face of mandible; row vertically down across opercle close behind preopercle.

Second dorsal spine 1 1/2 in total head length, 2 2/5 in combined head and trunk; second dorsal ray 1 1/4 to 1 7/8 in head; second anal ray 1 2/5 to 1 7/8; caudal 1 1/10 to 1 1/8, rounded behind; pectoral 1 1/8, 2 2/3 in combined head and trunk; ventral 2 3/5 to 2 2/3.

Brown, but little paler on under surface of head and belly. Two pale bands, with dark line at each border, on snout; 4 extend down from eye across cheek vertically, most posterior arching up posteriorly over back with 1 parallel in front also to eye; 1 crosses predorsal, forks below over opercle and hind branch down behind pectoral or sometimes united with pale band extending down from spinous dorsal origin. On trunk 3 or 4 more below dorsals, alternating with narrower similar pale bands, all fading out below. Bands on head extend across iris to pupil. Dorsals brownish, other fins pale. Length 19 to 26 mm.

In the Agassiz Museum 3 from the Society Islands obtained by Andrew Garrett and 1 from Bora Bora, Society Islands. The National Museum has 3 from Samoa and 1 from Bora Bora.

Melanesia, Polynesia.

Euctenogobius ophthalmonemus (Bleeker).

Gobius ophthalmonemus Bleeker: Nat. Tijds. Ned. Ind., vol. 12, p. 208, 1856-57 (type loc., Ternate).

Euctenogobius ophthalmonema Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 180, pl. 111, fig. B, 1877 (Society and Fiji islands).—Günther: Rept. voyage "Challenger," vol. 1, p. 135, 1880 (Kandavu, Fiji).

Pselapaphias ophthalmonemus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 406, 1905 (1906) (Vaisigano River at Apia).

Head 4 1/8; depth 5 2/3; D. VI, I, 12, 1; A. I, 13, 1; scales 55, 10 transversely; snout 2 4/5 in head; eye 3 4/5, 1 1/8 in snout. Tentacle above eye equals its vertical diameter. Maxillary reaches opposite middle of eye. Interorbital narrow. Sides of head naked. Dorsal spines end in filaments, first half of combined head and body; last ray equals head; last anal ray 1 1/5; caudal peduncle depth 2 1/4; caudal ends in median point, 2 1/5 in combined head and body; pectoral 1 in head; ventral 1 1/10. Dorsals finely dotted blackish. Caudal peduncle dark above and below. Length 127 mm. (Günther)

In the National Museum 2 from Apia.

East Indies, Polynesia.

Waitea mystacina (Valenciennes).

Gobius mystacinus Valenciennes: Hist. nat. Poiss., vol. 12, p. 94, 1837 (type loc., Java).

Waitea mystacina Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 407, fig. 94. 1905 (1906) (Samoa).

Gobius pulverulentus (Kuhl and Van Hasselt) Valenciennes: Hist. nat. Poiss., vol. 12, p. 94, 1837 (name in text).

Head 3 2/5; depth 4 3/5; D. VI-I, 9; A. I, 11; P. 17; V. I, 5; scales about 25 in median lateral series to caudal base (most fallen) and 3 more on latter; 7 scales transversely at soft dorsal origin; snout 3 2/5 in head measured from snout tip; eye 4; maxillary 1 2/3; interorbital 1/4 of eye.

Body moderately compressed, elongate. Caudal peduncle compressed, least depth 1 1/3 in its length or 3 1/5 in total head length.

Head compressed, width 2 in its length. Snout obtuse, convex, length 3/4 its width. Eye large, superolateral, hind edge midway in head length; diameter but slightly less than snout. Mouth large, lower jaw very slightly protrudes. Maxillary long, extends back beyond eye or nearly 3/5 in total head length. Teeth in jaws biserial, outer series slender, curved slightly and little longer; no canines. Tongue broadly rounded in front, with slight median notch. Nostril rather large pore close before front of eye. Interorbital very narrow, bony.

Gill opening 2 1/5 in head. Gill rakers flexible, slender, on second arch 15 on lower branch, 1 1/2 in gill filaments, which 2 in eye.

Scales with 23 to 38 basal striae; apical denticles 34 to 50; circuli rather fine. Head naked, except occipital region. Scales large on trunk and tail, caducous.

Fourth dorsal spine with terminal filament, nearly long as head; sixth ray 1 1/4; tenth anal ray 1 1/2; pectoral 1; ventral 1 1/8; caudal 2 1/2 in combined head and trunk.

Brown, paler below. Back mottled with darker and along side 5 median large brownish blotches, last at caudal base. Dorsals and caudal barred finely with dusky. Pectoral brownish and ventral brown, becoming dusky terminally. Anal pale. Length 72 mm.

In the Agassiz Museum 1 from the Society Islands, obtained by Andrew Garrett. Only known previously from Oceania by Jordan and Seale's record for Samoa. Though they do not give details of their material their figure agrees largely with my specimen, especially in its color pattern.

East Indies, Polynesia.

Oxyurichthus jaarmani Weber.

Oxyurichthys jaarmani Weber: Nova Guinea, vol. 9, pt. 4, p. 601, 1913 (type loc., Lorentz River).

Head 3 1/2; depth 5 1/3; D. VI, 11; A. 12; scales 30, 7 transversely. Head obtuse, deeper than wide. Eye 2 4/5 in head, little longer than snout. Mouth cleft nearly horizontal, reaches front pupil edge. Outer teeth enlarged, curved. Scales ctenoid, smaller and less ctenoid anteriorly, absent on head and in median predorsal strip. First 2 dorsal spines with prolonged filaments. Last dorsal and anal rays reach caudal base. Caudal over 2 in total. Pectoral longer than head, somewhat shorter than ventral. Brownish-yellow, with suggestion of dark blotches at caudal base. Hind edge of scales with narrow black border. Vertical fins blotched dark. Length 50 mm. (Weber)

Oxyurichthus laterisquamatus Weber.

Oxyurichthys laterisquamatus Weber: Nova Guinea, vol. 5, pt. 2, p. 261, 1908 (type loc., Tami Basin, north New Guinea).

Head 4 3/4; depth 6; D. VI-11; A. 11; scales 60, 12 transversely. Eye little less than obtuse, convex snout, or 5 in head. Mouth cleft oblique, upper jaw to first third of eye. Teeth small, conic, brown, outer row enlarged. Tongue weakly convex in front. Interorbital half eye-diameter. Anterior scales small, cycloid; cover predorsal to eye, cheek, sparse on opercle above. Dorsal spines all elongate, also rays which reach caudal and anal, only somewhat shorter. Yellowish, with diffuse crossbands. Back with scales darker marginally. Dorsals, anal and upper caudal rays blotched dark. Paired fins hyaline, with black blotch on upper third of pectoral base. Length 117 mm. without caudal. (Weber)

Gobiichthys papuensis (Valenciennes).

Gobius papuensis Valenciennes: Hist. nat. Poiss., vol. 12, p. 80, 1837 (type loc., New Guinea; Java).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 517, 1900 (Hawaii).

Gobionellus papuensis Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).

Gobiichthys papuensis Fowler: B. P. Bishop Mus., Bull. 22, p. 17, 1925 (Guam).

Acentrogobius ophthalmotaenia (non Bleeker) Streets: U. S. Nat. Mus., Bull., no. 7, p. 60, 1877 (coral reefs at Oahu).

Gobionellus lonchotus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 503, fig. 44, 1902 (1903) (type loc., Honolulu).

Gobiichthys lonchotus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 485, fig. 213, 1903 (1905) (Hilo; Honolulu; Waikiki).

Oxyurichthys lonchotus Jordan and Snyder: (U. S.) Bur. Fish., Bull., vol. 26, p. 218, 1906 (1907) (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 78, Dec., 1922 (Hawaii).

Head 3 2/5 to 4; depth 4 1/8 to 5 2/3; D. VI-I, 12, 1; A. I, 13, 1; scales 65 to 81 in median lateral series to caudal base; 16 to 22 scales transversely; predorsal scales 25; snout 3 1/8 to 3 1/2 in head measured from upper jaw tip; eye 4 3/4 to 5; maxillary 2; interorbital 2 to 3 in eye.

Body long, rather slender, compressed. Caudal peduncle well compressed, least depth 1 1/5 to 1 1/3 in its length or 2 3/5 to 3 1/8 in total head length.

Head width 2 to 2 1/8 in its length. Snout obtuse, convex, length 4/5 to 7/8 its width. Eye large, hind edge midway in head length measured from upper jaw tip; diameter 1 1/4 to 1 1/3 in snout. Mouth large, lower jaw protruding. Maxillary reaches opposite hind pupil edge. Teeth moderate, conic, uniserial above, variably biserial or triserial teeth in front of jaw; lower teeth triserial in front of mandible, variably quadriserial and become biserial laterally. Tongue convex in front. Nostrils separated; front one about first third in snout; hind one about last third in snout. Interorbital narrowly concave.

Gill rakers 2 + 8, lanceolate, length half of gill filaments, which 1 7/8 in eye.

Scales with 24 to 29 close set radiating basal striae; apical denticles 23 to 25; circuli fine. Row of fine papillae down from front eye edge vertically toward maxillary medianly and horizontal branch forward along preorbital; row along and close below lower eye edge, with branch downward from antero-inferior eye edge and 2 shorter from postero-inferior eye edge; 2 horizontal lines also extend across cheek which may be more or less connected by 1 or 2 inter extensions; line over along front opercle edge, bar above horizontal and another below obliquely; short line above behind hind nostril; vertical bar and 2 horizontal from behind eye; postocular line also extending to suprascapula.

First dorsal spine long as head, 1 2/5 in head; twelfth dorsal ray 1 2/5; twelfth anal ray 1 2/5 to 1 2/3; caudal ends in long point behind, 1 3/4 to 2 1/4 to caudal base; pectoral 3 to 3 1/5; ventral 1 to 1 1/10 in head.

Brown, little paler on under surface of head and abdomen. Side with 6 large dark blotches. Along lower part of side several smaller dark alternate blotches, also one opposite each of large median lateral blotches. Dorsal deeper brown, each with several longitudinal deep or dusky bands. Caudal with similar, more numerous, though paler and transverse bands. Pectoral brownish, faintly with crossbands. Ventral with median rays blackish, otherwise brownish. Length 120 mm.

In the Agassiz Museum 12 from the Society Islands obtained by Andrew Garrett. Also 6 Hawaiian and 1 from the Kingsmill Islands, from the same. The Academy has 2 Hawaiian specimens and 1 from Honolulu, through B. Sharp, largest 110 mm. In the Bishop Museum 19 from Honolulu and 3 from off Waialae, Oahu. Largest 120 mm. The National Museum has 1 Hawaiian and 4 from Honolulu through T. H. Streets.

Jordan and Evermann admit the validity of *Gobionellus lonchotus* Jenkins, which they place in *Gobiichthys*, stating that it has "teeth of upper jaw in a single row, in which respect this genus differs from *Gobionellus* Girard." They, however, describe *Gobiichthys lonchotus* with "teeth in jaws in several series," thus violating the generic character. Their figure was a copy of Jenkins' figure, drawn from his type. It shows no dark blotch at the caudal base or dark lines on the spinous dorsal and soft dorsal anteriorly, such as may still be made out in my material. This agrees in every way with Günther's excellent description (Cat. fishes Brit. Mus., vol. 3, p. 49, 1861) and I feel convinced that the Hawaiian and Papuan specimens are the same species. It follows that Jordan and Evermann are wrong in placing my specimen in the references to *Awaous stamineus*. Weber places *Gobius papuensis* in *Oxyurichthus* Bleeker, but this of later date than *Gobionellus*. Jouan gives a description under *Gobiomorus* of an example 120 mm. from Baie du Sud, New Caledonia (Soc. Cherbourg, Mem., vol. 9, p. 108, 1863). It differs a little in that the eye is said to be behind the mouth angle and coloration somewhat different.

East Indies, Micronesia, Polynesia, Hawaii.

Periophthalmus koelreuteri (Pallas) (fig. 63).

Gobius koelreuteri Pallas: Spicilegia, fasc. 8, p. 8, pl. 2, figs, 1-3, 1770 (type locality unknown).

Periophthalmus koelreuteri Valenciennes: Hist. nat. Poiss., vol. 12, p. 136, 1837 (Port Praslin, New Ireland; Waigiu; Oualan; New Guinea; Vanicolo).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 18, 1869 (South Sea; Pelew Islands).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 185, 1877 (Pelew Islands; Samoa; Fiji).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 361, 1882 (New Guinea).—Ogilby: Linn. Soc. New South Wales, Proc., vol. 22, p. 770, 1897 (New Caledonia).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 126, 1900 (Guam).—Weber: Nova Guinea, vol. 5, pt. 2, p. 262, 1908 (Tjintjan Bay, north New Guinea; Merauke River mouth, south New Guinea).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 18, p. 206, 1912 (Port Sandwich, New Hebrides).—Weber: Nova Guinea, vol. 9, pt. 4, p. 603, 1913 (Lorentz River, New Guinea).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 147, 1913 (Saonek, Waigiu; Sorang, New Guinea).—McCulloch and Ogilby: Australian Mus., Records, vol. 13, p. 194, 1919 (Samoa; Bougainville Island; Solomons).—Fowler: B. P. Bishop Mus., Bull. 22, p. 36, 1925 (Samoa).

Periopthalmus koelreuteri Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1. p. 334, 1876 (Katow River mouth, New Guinea).

Periophthalmus kölreuteri Günther: Rept. voyage "Challenger," vol. 1, p. 35, 1880 (Kandavu, Fiji).

Periophthalmus kaelreuteri Pellegrin: Mus. Hist. Nat. Paris, Bull., 4, p. 229, 1898 (Sayapan, Marianas).

Periophtalmus kalolo Lesson: Voyage "Coquille,"

Zool., vol. 2, pt. 1, p. 146, 1830 (type loc., Offack, Waigiu; Port Praslin, New Ireland; Oualan).

Periophthalmus argentilineatus Valenciennes: Hist. nat. Poiss., vol. 12, p. 144, 1837 (type loc., Waigiu; Oualan; New Guinea; Irawaddy River, Burma; Java).—Günther: Cat. fishes Brit. Mus., vol. 3, p. 98, 1861 (Fiji).—Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1860 (Waigiu).

Periophthalmus koelreuteri var. *argentilineatus* Schmeltz: Mus. Godeffroy, Cat. 4, p. 18, 1861 (Samoa).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1407, 1906 (Upolu).—McCulloch and Ogilby: Australian Mus., Records, vol. 12, no. 10, p. 194, pl. 31, fig. 1, 1919 (Samoa; Bougainville Island; Solomons).

Periophthalmus barbarus (non Linné) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 84, 1906 (Faté).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 393, fig. 1. (on p. 174), 1905 (1906) (Aua, Pago Pago, Vaisigano River at Apia).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 317, 1911 (Moen, Truk Group, Carolines; Suva, Fiji).

FIGURE 63.—Drawing of *Periophthalmus koelreuteri*.

Head 3 1/3 to 3 1/2; depth 4 1/4 to 6; D. XI-1, 12, 1 or X, 1, 10, 1; A. 1, 8, 1 or 9, 1; scales 82 to 88 in median lateral series to caudal base and 5 more on latter; 22 to 26 scales transversely; 22 to 38 predorsal scales; snout 2 3/5 to 3 in head; eye 3 1/4 to 3 1/2; maxillary 2 1/6 to 2 1/2; interorbital 1 1/2 to 1 3/4 in eye. Scales with 24 to 30 basal radiating striae; apical denticles 17; circuli moderately fine.

The Academy has 5 labeled Pacific Ocean and 3 from Apia, largest 133 mm. The Bishop Museum has 1 from Faté and 2 Agaña on Guam, largest 138 mm. In the Agassiz Museum 3 from Apia, 1 Suva, 12 Ascension Island, through Rev. B. G. Snow, 1 Kusaie and 5 Strong Island, all through Rev. B. G. Snow. The National Museum has 4 from Fiji obtained by the Wilkes Expedition. Also 7 from Samoa through C. H. White, 10 or more from Apia, 2 Truk, 2 New Guinea.

West Africa, Red Sea, Seychelles, Ceylon, East Indies, China, Japan, northwest Australia. Queensland, Melanesia, Micronesia, Polynesia.

Periophthalmus barbarus (Linné).

Gobius barbarus Linné: Systema nat., 12th ed., p. 450, 1766 (habitat?).—Bonnaterre: Tableau ichth., p. 63, pl. 35, fig. 137, 1788 (China).

Gobius schlosseri Pallas: Spicilegia, Zool., fasc., 8, p. 1, pl. 1, figs. 1-4, 1770 (type loc., Amboyna).

Periophthalmus schlosseri Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).—Peters: Akad. Wiss. Berlin, Monatsb., p. 840. 1876 (1877) (New Guinea).—Ramsay and Ogilby: Linn. Soc. New South Wales, Proc., 2nd ser., vol. 1, p. 8, 1886 (Strickland River, New Guinea).—Garman: Mus. Comp. Zool., Bull., vol. 39, p. 235, 1903 (Suva, Fiji).—Weber: Nova Guinea, vol. 9, pt. 4, p. 602, 1913 (Lorentz River, Biviak Island; Utumbuwe River in south New Guinea).—Regan: Zool. Soc. London, Trans., vol. 20, pt. 6. p. 276, 1914 (Mimika River, New Guinea).

Periophthalmus australis Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 334, pl. 11, fig. 3, 1876 (mouths of all streams flowing into Hall Sound, New Guinea).

Distinguished from *Periophthalmus koelreuteri* by the larger scales (50 as compared with 70) and the teeth biserial.

Two small specimens in the Agassiz Museum from Suva.

India, Burma, Andamans, Siam, East Indies, Philippines, northwest Australia, Queensland, Polynesia.

Apocryptodon fasciatus (Macleay).

Apocryptes fasciatus Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 268, 1883 (type loc., New Guinea).

Head 4; depth 4; D. VI, 15; A. 15; lateral line 56. Body compressed, head less so, convex between eyes and rounded on snout. Eyes moderate, less than diameter apart and diameter from snout; strong bony elevation on front orbital edges. Mouth oblique, gape to below middle of eye. Cheek naked, or nearly so. Dorsal spines filamentous, connecting membrane not nearly extending to middle. Caudal rounded. Dark, with 6 broad darker bands on sides. Soft dorsal and anal with small blue or light colored dots. (Macleay)

Apocryptes rictuosus Valenciennes.

Apocryptes rictuosus Valenciennes: Hist. nat. Poiss., vol. 12, p. 114, 1837 (type loc., mouth of Arian River, Pondicherry).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 18, 1869 (Pelew Islands).

Head 7 1/2 in total; depth 11 to 13; D. VI, 24 to 27; A. 25 to 29; scales 75. Head width half its length. Snout rather obtuse. Eye 6 to 7 in head, about equals snout, 1/3 diameter apart. Mouth cleft deep, reaches diameter of eye behind orbit. Teeth pointed, 20 to 28 in either ramus of lower jaw, most external recurved; rather large number of pointed ones in upper jaw; pair of small canines internally, above symphysis of lower jaw. Scales in irregular rows, very small before dorsal, become larger posteriorly. Dorsal spines with prolonged filaments, not much higher than soft dorsal. Last dorsal ray reaches caudal base. Anal begins below second or

third dorsal ray. Caudal pointed, very elongate. Pectoral equals head without snout, also equals ventral.

Grayish, lighter towards abdomen, with badly defined oblique bands passing downwards and forwards from base of dorsal fin half way to abdomen. Inside mouth with black spots. Dorsals, anal and pectoral whitish, externally stained gray, sometimes spotted brown; usually black spot ringed yellow on last few dorsal rays. Reaches 191 mm. (Day)

India, Micronesia.

Apocryptes lanceolatus (Schneider).

Eleotris lanceolata Schneider: Systema ichth., Bloch, p. 67, pl. 15, 1801 (type loc., Tranquebar).

Apocryptes lanceolatus Kner: Reise "Novara," Fische, vol. 2, p. 180, 1865 (Tahiti).

Head 5 3/4; depth 7; D. V-31 or 32; A. 29 or 30; snout 5 4/5 in head; eye 6 to 7, 1 1/4 in snout, 1 in interorbital. Head width half or more its length. Jaws nearly equal. Maxillary reaches below middle or hind edge of eye. Upper teeth moderate, truncate or slightly swollen; lower teeth horizontal, outer sometimes recurved and little enlarged; pair of posterior canines above symphysis. Scales minute, most distinct posteriorly. Dorsals high as half body depth. Caudal lanceolate, 4 3/4 in rest of body. Pectoral 1 1/4 in head; ventral 1 1/2.

Dull greenish above, with numerous fine brown spots and usually many dark bands descend from back towards abdomen. Dorsals with several rows of fine spots. Caudal barred in few or many rows. Reaches 204 mm. (Day)

This falls in Bleeker's subgenus *Pseudapocryptes*.

Jouan describes some species of *Apocryptes* as *Gobioides* (Soc. Cherbourg, Mem., vol. 9, p. 118, 1863) on a specimen 200 mm. long from Port de France, New Caledonia. It approaches *Apocryptes bato* (Buchanan-Hamilton), but according to Day's description it would differ in fewer anal rays, 17 compared with 23, head 4 in total compared with 6 to 6 1/2. Its coloration is described with a broad yellowish-white longitudinal band and 2 similar bands parallel above. Oblique blue-white line on opercle. Dorsal citron-yellow with 3 longitudinal rows of dark points. Anal citron-yellow, bordered by row of black points and reddish stripe. Caudal reddish, with white, yellow and black points. Pectoral colorless, red spot at origin.

India, East Indies, Polynesia.

Boleophthalmus boddaerti (Pallas).

Gobius boddaerti Pallas: Spicilegia, Zool., vol. 8, p. 11, pl., figs. 4-5, 1770 (type loc., Indian Ocean).

Boleophthalmus boddaerti Weber: Nova Guinea, vol. 9, pt. 4, p. 603, 1913 (Lorentz River).

Gobius striatus Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 229, 1898 (Guam).

Head 4 1/4 to 5 in total; depth 5 to 6; D. V, 24 or 25; A. 24; scales 70, 19 to 21 transversely. Head width equals its length without snout. Eyes elevated, projecting, 6 to 7 in head, 1 to 1 1/2 in snout, 1/4 diameter apart. Jaws about equal. Maxillary reaches below hind eye edge. Barbels absent. Above 6 median teeth canines and 30 more pointed smaller laterally; lower teeth horizontal, 30 on either ramus, truncated at summits, some with slight lobe either side; above symphysis pair of posterior canines. Scales cycloid, scarcely imbricate on head; each scale on head and front part of body with rough elevation.

Greenish-blue with 7 or 8 vertical black bands. Body covered with opaque blue spots. First dorsal blue-spotted, 3 rows on second and 4 large series along its base. Anal and caudal blackish. Pectoral orange, edge black or dark with orange edge. Ventral purplish. (Day)

India, Burma, East Indies, Micronesia.

Boleophthalmus dentatus Valenciennes.

Boleophthalmus dentatus Valenciennes: Hist. nat. Poiss., vol. 12, p. 157, pl. 355, 1837 (type loc., Bombay).—Weber: Nova Guinea, vol. 5, pt. 2, p. 263, 1908 (Merauke River, south New Guinea).

Head 5 to 5 1/2 in total; depth 7 1/2 to 8 1/2; D. V, 27; A. 26 or 27. Head width half its length. Snout somewhat obtuse. Eye rather prominent, 7 in head, 1 1/2 to 2 from snout end, half diameter or less apart. Mouth cleft slightly oblique. Maxillary reaches hind eye edge. No barbels. Above 6 long median front teeth, followed by 25 each side; pair of large, recurved lower canines, followed by 35 to 40 nearly horizontal teeth each side, tip tricuspid or with slight outer lobe. Scales only distinct in narrow band on abdomen, along either side of anal, some along sides below second dorsal, and few towards head, elsewhere like rough points. First dorsal fourth higher than body below, rays extend beyond membrane which reaches origin of second dorsal; second dorsal inserted midway between snout and caudal base, rays half high as first dorsal, uniform throughout. Anal begins below fourth dorsal ray, hind rays little longest or rather higher than those of second dorsal. Caudal pointed, lower rays shorter than upper. Pectoral long as head behind orbit. Ventrals half of head, not half way to vent, entirely united.

Olive-gray, with dull vertical bands, 6 or 8 continued to lower half of second dorsal. First dorsal purplish, covered with black white-edged spots and upper fin edge yellowish. Second dorsal with 5 rows of oblong white spots and some black ones with white edges along first half of base. Upper caudal edge with white band and yellow spots between black rays. Length 191 mm. (Day)

India, East Indies.

Boleophthalmus sculptus Günther.

Boleophthalmus sculptus Günther: Cat. fishes Brit. Mus., vol. 3, p. 104, 1861 (type loc., India).—Weber: Nova Guinea, vol. 5, pt. 2, p. 262, 1908 (Merauke, south New Guinea).

Head 4 1/2 in total; depth 6 1/2; D. V, 25; A. 22. Front upper teeth slightly enlarged, below very small and horizontal. Head and body anteriorly without imbricate scales, but with flat round tubercles, on head and nape each with slight median impression, on sides flat like mosaic. Scales more distinct on tail and 8 between ends of dorsal and anal. More than half of pectoral scaly. Dorsal base moderate, third spine filliform. Anal opposite dorsal, lower.

Greenish-olive, yellowish on belly. Back with 6 rather indistinct darker bands obliquely toward belly. Front dorsal grayish, other fins reddish. Length 107 mm. (Günther)

India, East Indies.

Boleophthalmus viridis (Buchanan-Hamilton).

Gobius viridis Buchanan-Hamilton: Fishes of Ganges, pp. 42, 366, pl. 32, fig. 12, 1822 (type loc., Ganges estuaries).

Boleophthalmus viridis Weber: Nova Guinea, vol. 5, pt. 2, p. 262, 1908 (Merauke River mouth, south New Guinea).

Gobiosoma punctularum De Vis: Linn. Soc. New

South Wales, Proc., vol. 8, p. 449, 1883 (type loc., South Sea Islands?).

Boleophthalmus novae guineae Hase: Jena. Zietsch. Nat., vol. 51, p. 534, figs. 7-9, 1914 (type loc., Tami, Kaiser-Wilhelms Land, New Guinea).

Head 3 3/4 to 4 2/5; depth 6 1/5 to 9; D. V-1, 26 or 27; A. 1, 24 to 26; snout 3 to 3 4/5 in head; eye 3 3/4 to 5 1/2. Snout profile strongly rounded. Mouth cleft to below hind edge of eye. Front border of upper lip with 11 unequal papillae, lateral border crenulate. Mandible with mental barbule. Above 7 or 8 pairs of enlarged subulate teeth, followed by 6 to 8 similar, but much smaller teeth; 15 pairs of enlarged lower teeth, 4 smaller ones posterior and pair of strong recurved symphyseal canines. Body everywhere covered with minute scales, appearing as pit-like depressions. Third dorsal spine filamentous, in male reaches eighteenth dorsal ray, in female sometimes to sixth ray. Median caudal rays longest. Pectoral reaches below last dorsal spine. Ventral equals or little longer than pectoral.

Blue gray, washed brown with few small widely scattered black spots. Lips, throat and abdomen bluish white. Sometimes short black crossbars on middle of sides. Extension of dorsal blackish, base like back, sometimes with few small black spots. Soft dorsal brownish-blue, sparsely spotted black. Caudal bluish-gray, lower rays white, with numerous black spots in irregular transverse series. Anals and ventrals yellowish-white. Pectorals dark gray, with broad lighter border and some black basal spots. Reaches 140 mm. (McCulloch and Ogilby)

India, East Indies, China, north and northeast Australia.

Taenioides hermannii Lacépède.

Taenioides hermannii Lacépède: Hist. nat. Poiss., vol. 2, pp. 532. 533, pl. 14, fig. 1, 1800 (no type locality).

Taenioides hermannianus Weber: Nova Guinea, vol. 9, pt. 4, p. 603, 1913 (Lorentz River at Bivak Island).

Amblyopus hermannianus Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 281, 1868 (Doreh, New Guinea).

Head 8; depth 13; D. VI, 45 to 47; A. 44 or 45; snout 3 in head. Head width 2/3 to 3/5 its length. Eye minute. Mouth cleft nearly vertical, lower jaw produced with tubercle at symphysis and pair of short barbels, sometimes 2 more posteriorly. Teeth moderate, 16/14 larger anteriorly than band of villiform teeth; pair of posterior canines above symphysis of lower jaw. No scales. Dorsal enveloped in skin, not so high as body, separated or not by notch from caudal. Anal lower than dorsal, separate or joined with caudal. Caudal rhomboid, equals head. Pectoral basal half fleshy, not quite half long as ventral, which 1/4 shorter than head. Pinkish, caudal darkest medially. Reaches 384 mm. (Day)

India, East Indies.

Taenioides gertrudae Fowler (fig. 64).

Taenaeoides gertrudae Fowler: B. P. Bishop Mus., Bull. 22, p. 17, 1925 (type loc., Guam) [*Taenaeoides* a typographical error].

Apparently distinguished by its black median lateral band.

Type in the Bishop Museum and paratype in the Academy.

Trypauchen vagina (Schneider).

Gobius vagina Schneider: Systema ichth., Bloch, p. 73, 1801 (type loc., Tranquebar).

Gobioides totoyensis Garman: Mus. Comp. Zool., Bull., vol. 39, p. 235, pl. 3. figs. 1-2, 1903 (type loc., Totoya, Fiji).

Head 5 1/4; depth 7 1/2; D. VI, 45; A. 45. Head narrow above, swollen at forehead from mouth to occiput. Snout short. Eye minute. Mouth moderate, lips thick. Maxillary reaches below eye. Teeth in villiform bands, very small canine each side above and below. No barbels. Scales cycloid, appear absent from anterior 3/5 of body, backward comparatively large. Lateral line median. Vertical fins continuous. Caudal ends in point, slightly less than head. Brownish-white, probably flesh-color or yellowish in life. (Garman)

I examined the type of *Gobioides totoyensis* in the Agassiz Museum.

India, East Indies, China, Polynesia.

ECHENEIDAE

Echeneis clypeata Günther.

Echeneis clypeata Günther: Cat. fishes Brit. Mus., vol. 2, p. 376, 1860 (type loc., Cape Seas).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 155, 1876 (probably Pacific Ocean).

Disk 3 1/7 in total, width of body between pectorals 5; D. XII-17; A. 20. Mouth angle reaches vertical of second dorsal lamina. Lower jaw and vomer anteriorly with series of wide-set stronger teeth. Caudal subtruncate. Ventral much less than space between pectoral base and hind eye edge. Uniform brown. (Günther)

Echeneis albescens Schlegel.

Echeneis albescens Schlegel: Fauna Japonica, Poiss., pt. 15, p. 272, pl. 120, fig. 4, 1850 (type loc., Japan).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. (3) 20, 1859 (Doreh, New Guinea).—Günther: Mus. Godeffroy, Jour., vol., 5, pt. 11, p. 155, 1876 (probably South Seas).—Günther: Rept. voyage "Challenger," vol. 31, pt. 2, p. 18, 1888 (1889) (north of New Guinea).

Disk 3 1/4 in total, width of body between pectorals 5 1/2; D. XIII-22; A. 22. Mouth obtuse. Mouth angle reaches vertical of third dorsal lamina. Lower jaw and vomer anteriorly with series of widely-set stronger teeth. Caudal subtruncate. Ventral equals space between pectoral base and hind eye edge. Uniform gray brown. (Günther)

Echeneis remora Linné (fig. 65).

Echeneis remora Linné: Systema nat., 10th ed., p. 260, 1758 (type loc., in Pelago Indico).—Lichtenstein: Descriptiones animalium, pp. 155, 257, 1844 (tropical Pacific; Tanna).—Kner: Reise "Novara," Fische, vol. 1, p. 146, 1865 (Tahiti).—Schmeltz: Mus. Godeffroy, Cat. 4. p. 17, 1869 (Samoa).—Schmeltz: op. cit., Cat.

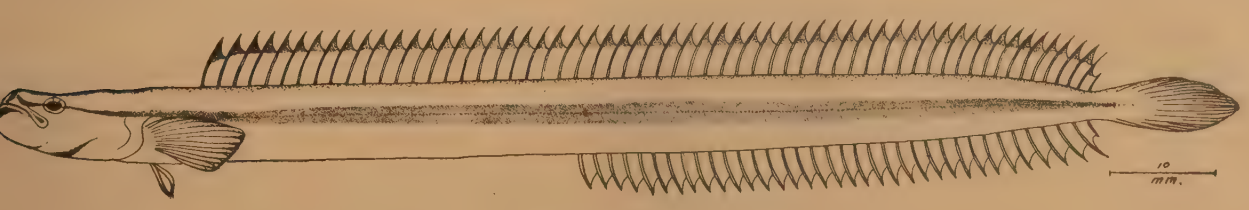

FIGURE 64.—Drawing of *Taenioides gertrudae* Fowler.

5, p. 26, 1874 (Samoa).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 156, 1876 (all warm seas).—Streets: U. S. Nat. Mus., Bull., no. 7, p. 92, 1877 (Washington Island, Fanning Group).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 496, 1901 (between Honolulu and Cape Horn).—Snyder: U. S. Fish Comm., Bull., vol. 22, p. 536. 1902 (1904) (Hanalei Bay and off Hawaiian islands).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 494, 1903 (1905) (Honolulu).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1407, 1906 (Upolu).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 331, 1911 (Society Islands; Fakarava, Paumotus).—Fowler: Copeia, no. 112, p. 84, Nov. 20. 1922 (Hawaii).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 27, 1925 (Wake Island).—Fowler: op. cit., Bull. 38, p. 29, 1927 (Baker Island).

Remora remora Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 946, 1904 (Honolulu).—Jordan and Dickerson: op. cit., vol. 34, p. 617, 1908 (Suva, Fiji).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 77, Dec. 1922 (Hawaii).

Remora albescens (non Schlegel) Fowler: Acad Nat. Sci. Philadelphia, Proc., p. 517, 1900 (Hawaiian islands).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 21, 1902 (Honolulu).—Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 135, 1902 (1903) (Marcus Island).

Caledonia, which he thinks may not differ from this species (Soc. Cherbourg, Mem., vol. 8, p. 254, 1861).

Leptecheneis naucrates (Linné) (fig. 66).

Echeneis neucrates Linné: Systema nat., 10th ed., p. 261, 1758 (type loc., in Pelago Indico).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, pp. 3, 5, 1859 (Doreh, New Guinea).

Echeneis naucrates Lichtenstein: Descriptiones animalium, p. 257, 1844 (Tanna; New Caledonia).—Castelnau: Zool. Acclimat. Soc. Victoria, Proc., vol. 2, p. 114, 1873 (Noumea, New Caledonia).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 156, pl. 97, 1876 (Pacific Ocean).—Peters: Akad. Wiss. Berlin, Monatsb., p. 836, 1876 (1877) (Bougainville; Solomon Islands).—Jouan: Soc. Cherbourg, Mem., vol. 21, p. 334, 1877-78 (New Caledonia).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 266, 1883 (Hood Bay, New Guinea).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 27, 1885 (Rubi, New Guinea).—Günther: Rept. voyage "Challenger," vol. 31, pt. 2, p. 18, 1888 (1889) (Kandavu).—Waite: Australian Mus., Mem., no. 3, p. 190, 1897 (Funafuti. Ellice Islands).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 528, 1900 (Samoa).—Jordan and Seale: (U. S.) Bur.

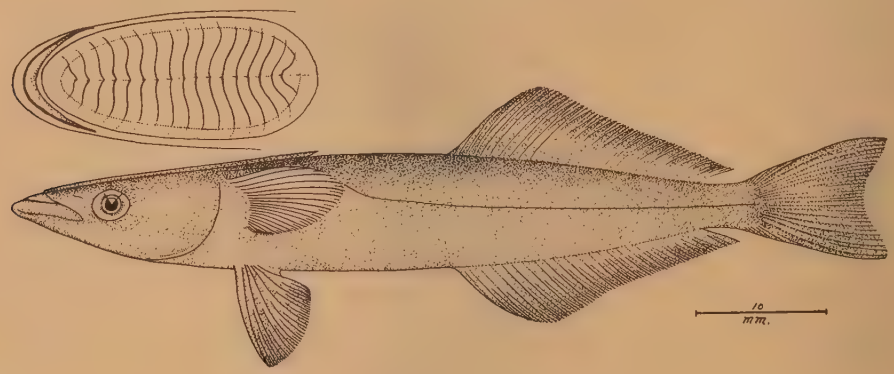

FIGURE 65.—Drawing of *Echeneis remora*.

Differs from *E. clypeata* in the D. XVII to XIX-22 to 24 and A. 25. Uniform brown.

One in the Academy from the Hawaiian islands obtained by Thomas Nuttall, 112 mm. long. It has D. XVII-IV, 16; A. II, 20. The Bishop Museum has 3 from Honolulu; 1 from N. Lat. 6° W. Long. 162° through C. Montague Cooke, Jr., in 1913; 1 from Marcus Island. Largest 301 mm. Two small specimens from Wake Island in 1923. The National Museum has 1 from Hulls Sound, 1 Hulls Island, and 1 Tuamotu, all obtained by the Wilkes Expedition. Also 1 from Tahiti through W. H. Jones, 2 Honolulu, 1 Fanning Islands, 4 Fakarava, 1 between Easter Island and the Galapagos, and 4 from Surface Station A. A. 17 on September 3, 1899. The Agassiz Museum has a young black Hawaiian specimen through W. T. Brigham, 1 South Pacific, 4 Society Islands, 1 Apiang, and 2 Ebon Island.

Jouan notices *Echeneis* No. 23 from sharks from about 60 leagues south-southeast of New

Fish., Bull., vol. 25, p. 411, 1905 (1906) (Apia).—Weber: Nova Guinea, vol. 5, pt. 2, p. 263, 1908 (Mios Kouvar, Pacific; Merauke River mouth, south New Guinea; west coast of New Guinea).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26. p. 330, 1911 (Fakarava and Makemo, Paumotus; Funafuti, Ellice Islands).

Leptecheneis neucrates Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 37, 1878 (New Guinea).

Leptecheneis naucrates Fowler: B. P. Bishop Mus., Bull. 22, p. 36, 1925 (Samoa).

Echeneis vittatus Lowe: Zool. Soc. London, Proc., pt. 7, p. 89, 1839 (type loc., Madeira).—Jouan: Soc. Cherbourg, Mem., vol. 21, p. 334, 1877-78 (on *Echeneis* Jouan, op. cit., vol. 8, p. 254, no. 22, 1861, Port de France, New Caledonia).

Leptecheneis flaviventris Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 83, fig. 23, 1906 (type loc., Mangareva Island).

Head 5 1/6; depth 11 1/2; D. XXVI-IV, 31; A. III, 31; snout 2 1/10 in head measured from upper jaw tip; eye 6 1/2; maxillary 2 7/8; interorbital 1 4/5. Least depth of caudal peduncle 5 1/8 in total head length; head width 1 3/4 in its length; first branched dorsal ray 2 1/3; first branched anal ray 2; caudal 1 1/5; pectoral 1 1/4; ventral 1 2/5.

The Bishop Museum has the type of *Leptecheneis flaviventris*, 618 mm. noted above. It was

supposed to be "distinguished by the yellow color of the belly, the smaller eye, the greater length of the anal and dorsal rays," all characters easily covered by a series of *Leptecheneis naucrates*. One in the Academy from Samoa?, through Henry C. Caldwell. It shows D. XXV-IV, 35; A. II, 37. In the National Museum 1 from Makemo and 1 from Funafuti. In the Agassiz Museum 1 from Ebon Island, and 1 from Tuamotus.

Jouan describes *Echeneis* No. 22, from Port de France, New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 254, 1861), evidently this species.

Phtheirichthys lineatus (Menzies).

Echeneis lineatus Menzies: Linn. Soc. London, Trans., vol. 1, p. 187, pl. 17, fig. 1, 1791 (type loc., Pacific Ocean between the Tropics, adhering to turtles).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 156, pl. 97, 1876 (Pacific Ocean).

Head 4 2/3; depth 10; disk length 4 1/3; D. X-I, 33; A. I, 33; P. I, 19; V. I, 4; snout 2 1/2 in head measured from upper jaw tip; eye 4 1/3; maxillary 2 4/5; interorbital 2 1/10.

Body very long, slender, tapering from pectoral region. Least depth of caudal peduncle 5 2/3 in total head length. Head width 2 in its length, convex over lower surface, flattened above so disk extends back half way in depressed pectoral. Snout depressed, length 3/4 its width. Eye small, median in length of head. Mandible strongly protrudes, front dentition exposed. Maxillary reaches opposite hind nostril. Teeth rather large, simple, conic, in band in each jaw, narrowing toward rictus; row of small even teeth on each palatine and across vomer. Nostrils close together at last fifth in snout. Gill rakers 1 + 11, lanceolate, slightly less than gill filaments, which long as pupil. Pseudobranchiae long as gill filaments. Isthmus narrow, slenderly constricted forward with narrow groove.

Skin smooth, scaleless. Dorsal origin little nearer caudal base than snout tip, front lobe 1 3/4 in total head length. Anal like dorsal, opposite, front lobe 1 4/5 in head. Caudal with median rays produced to long slender point, 1 1/3 times longer than rest of fin. Pectoral rays flexible, upper longest, 1 1/2 in head. Ventral origin slightly behind that of pectoral, fin also depressible slightly more posteriorly, 1 3/4 in head.

Color in alcohol dull brownish, under a lens marked with fine close-set dusky dots. Dorsal and anal with front ray whitish, rest blackish. Caudal brown, upper and lower corners white and long median rays black. Pectoral whitish. Ventral blackish, front and hind edges whitish. Iris slaty. Length 80 mm.

One in the Bishop Museum from N. Lat. 6° W. Long. 162° at surface, in 1913, obtained by C. Montague Cooke, Jr.

Remoropsis brachyptera (Lowe).

Echeneis brachyptera Lowe: Zool. Soc. London, Proc., vol. 7, p. 89, 1839 (type loc., Madeira).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 155, 1876 (Pacific Ocean).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 10. no. 7, p. 387, 1923 (Honolulu).

Head 5; depth 10 1/3; disk length 2 1/4; D. XVIII-V, 16; A. IV, 20; P. I, 18; V. I, 4; snout 2 1/3 in head measured from upper jaw tip; eye 8; maxillary 3; interorbital 1 2/5.

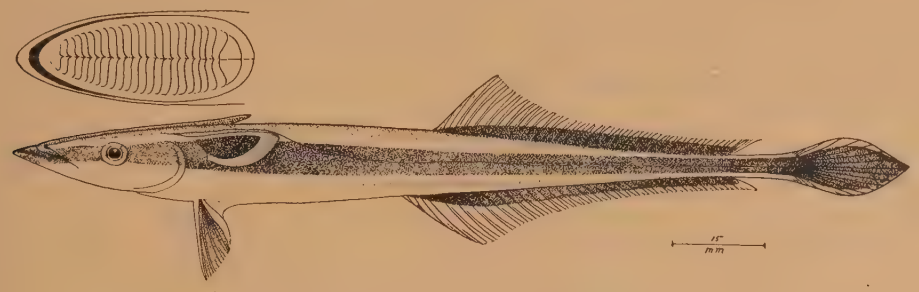

FIGURE 66.—Drawing of young *Leptecheneis naucrates*.

Body greatly depressed forward, broadly convex below, long disk extending beyond pectoral space equal to snout length. Least depth of caudal peduncle 6 in total head length. Head width equals its length as seen in profile. Snout very broad, flattened above, length 3/5 its width. Eye small, hind edge median in head length. Mandible broad, flattened, protruded, front dentition exposed, length 2 1/3 in head. Maxillary reaches opposite hind nostril. Teeth moderate, in villiform bands in jaws; row of larger teeth across vomer and on each palatine; tongue finely rough with patch of small teeth; outer row of slightly enlarged teeth along mandible edge, progressively larger toward rictus and last 2 largest, flaring out. Nostrils small, close together, at last 2/5 in snout. Gill opening extends forward slightly before front edge of eye. Gill rakers 2+9, VI, depressed points, 1/5 of gill filaments, which 2 1/5 in snout. No pseudobranchiae. Isthmus broad, constricted narrowly forward, with median longitudinal groove.

Skin smooth. Lateral line midway along side. Disk very large, width 2 1/3 in its length. Dorsal origin midway between gill opening and caudal base, first branched ray 2 1/5 in total head length. Anal similar, opposite, first branched ray 1 4/5 in head. Caudal truncate behind, 1 1/5 in head. Pectoral with firmly rigid rays, each expanded, osseous, especially terminally, 1 1/3 in head. Ventral inserted close behind pectoral base, reaches 2/5 to anal, not beyond sucking-disk, both fins depressible in groove, 1 3/5 in head. Vent close before anal.

Color in alcohol largely dull umber, under surface of head, pectorals, ventral bases and median line of lower surface with contrasted irregular whitish areas. Dorsal and anal dusky terminally. Ventral blackish terminally. Length 304 mm.

One in the Bishop Museum from Honolulu, likely captured on *Tetrapturus?*

Both *Echeneis squalipeta* Daldorf from the Atlantic and *Echeneis osteochir* Cuvier approach much closer in the disk laminae. *E. squalipeta* is said to have the disk extending nearly to the middle of the back, though its depth is given as about 1/4 of total length. *Echeneis osteochir* has compressed ossified pectoral rays, but is from unkown locality.

CALLIONYMIDAE

Draconetta hawaiiensis Gilbert.

Draconetta hawaiiensis Gilbert: U. S. Fish. Comm., Bull., vol. 23, pt. 2, p. 652, pl. 91, 1903 (1905) (type loc., between Molokai and Maui in 122 to 132 fathoms).

Head 3; depth 7 1/4; D. III-12; A. 12; snout 4 in head; eye 3 2/3; maxillary 3 3/5. Light gray, back with faint traces of 5 darker crossbands, also back faintly spotted and mottled darker. Spinous dorsal blackish posteriorly. Soft dorsal with 2 narrow black horizontal lines. Caudal with 2 faint dark bars basally. Two small black spots at pectoral base. Length 53 mm. (Gilbert)

Said to differ from *Draconetta xenica* (Jordan and Fowler) in the smaller eye, straight opercular spine and longer, stronger subopercular spine, longer dorsal spines and longer ventral fins.

Calliurichthys japonicus (Houttuyn).

Callionymus japonicus Houttuyn: Hollandsche Maatsch. Wet. Haarlem, Verh., vol. 20, p. 312, 1782 (type loc., Japan).

Callionymus simplicicornis Valenciennes: Hist. nat. Poiss., vol. 12, p. 226, 1837 (type loc., Guam).

Callionymus longecaudatus Günther: Cat. fishes Brit. Mus., vol. 3, p. 148, 1866 (Pacific; type of *Callionymus belcheri* Richardson).

Callionymus longicaudatus Günther: Rept. voyage "Challenger," vol. 1, p. 44, 1880 (South of New Guinea in S. Lat. 9° 59′ E. Long. 139° 42′).—Weber: Siboga Exped., vol. 65, Fische, p. 525, 1913 (off Waigiu in N. Lat. 0° 7′.2 E. Long. 130° 25′.5 in 59 to 83 m.).

Head 3 1/3; depth 10; D. IV, 9; A. 8. Top of head with 2 rough areas. Caudal long as rest of body in males. Reaches nearly 300 mm.

The species *Callionymus simplicicornis,* based on a young specimen but 38 mm. long, may be this species.

East Indies, Japan, Micronesia.

Calliurichthys decoratus Gilbert.

Calliurichthys decoratus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 651, pl. 90, 1903 (1905) (type loc., Penguin Bank off southern Oahu in 27 fathoms; Molokai; Pailolo Channel in 23 to 52 fathoms).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 10, no. 7, p. 389, 1923 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 38, p. 29, 1927 (Honolulu).

Calliurichthys astrinus Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 80, pl. 4, fig. 1, Dec., 1922 (type loc.. Honolulu).

Calliurichthys zanectes Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 81, pl. 4, fig. 2, Dec., 1922 (type loc., Honolulu).

The Bishop Museum has 10 specimens from Honolulu, largest 354 mm. In the National Museum a series of types of *Calliurichthys decoratus.*

This species differs from *Calliurichthys japonicus* in having only the first dorsal spine ending in a long filament and none of the other spines filamentous. Also the lower border of caudal pale in the present species, black in *Calliurichthys japonicus.*

Calliurichthys xanthosemeion Fowler (fig. 67).

Calliurichthys xanthosemeion Fowler: B. P. Bishop Mus., Bull. 22, p. 18, 1925 (type loc., Guam).

Types, 3 specimens in the Bishop Museum from Guam in 1923. Known by the bright yellow tip to the spinous dorsal.

Callionymus calauropomus Richardson.

Callionymus calauropomus Richardson: Voyage "Erebus" and "Terror," Fishes, p. 10, pl. 7, figs. 4-5, 1848 (type loc., Australia).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 19, 1869 (Ovalau).—Schmeltz: op. cit., Cat. 5, p. 29, 1874 (Ovalau; Tonga).—Peters: Akad. Wiss. Berlin, Monatsb., p. 841, 1876 (1877) (New Ireland).

Head 2 2/5; depth 6 1/2; D. IV-8; A. 7. Preopercular spine with single large hook above. First dorsal spine long as caudal, last spine 1/3. Second dorsal with rays branched, nearly long as head. Lunate black spot on membrane of last dorsal spine. Length 204 mm. (Schlegel)

Evidently the original description of this species applies to the female and *Callionymus altivelis* Schlegel the male.

FIGURE 67.—Drawing of *Calliurichthys xanthosemeion.*

Japan, northwest Australia, Melanesia, Polynesia.

Callionymus picturatus Peters.

Callionymus picturatus Peters: Akad. Wiss. Berlin, Monatsb., p. 840, 1876 (1877) (type loc., Salawatty, off northwest New Guinea).

Head 3 1/4 in total; caudal 3 3/4; D. IV-I, 8; A. 8. Preopercle [praorbitalstachel] spine ends in 2 spines and medially above third spine. Rose-red, with ocellate blotches, medially black, with 3 rings as inner ring rose, median black and outer bluish. Second fourth of caudal bluish, end black. First dorsal with ocellus. Second dorsal and anal black, with oblique blue lines. Paired fins clear blue. Ventral black basally. Length 210 mm. (Peters)

Callionymus rubrovinctus Gilbert.

Callionymus rubrovinctus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 650, fig. 252, 1903 (1905) (type loc., between Maui and Lanai in 28 to 43 fathoms; off Molokai in 23 to 43 fathoms).

Head 3; depth 5 3/5; D. IV-8 or 9; A. 7 or 8. Preopercular spine very long, robust, tip hooked up and

2 stronger spines directed upward. First dorsal spine produced in filament extending to or beyond last dorsal ray base. Back with 4 bright red bars nearly to middle of sides. Lower half of sides with 4 irregular brownish-black blotches. Anal black. Small black spot in ventral axil. Length 24 mm. (Gilbert)

Callionymus caeruleonotatus Gilbert.

Callionymus caeruleonotatus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 648, pl. 89, 1903 (1905) (type loc., east of Maui in 49 to 176 fathoms; Pailolo Channel in 49 to 176 fathoms).

Head 3 2/5; depth 8 3/4; D. IV-9; A. 8. Preopercular spine with 4 or 5 hooked spines above, besides terminal spine. First dorsal spine equal or subequal with second, third and fourth rapidly shortened. Spinous dorsal dusky-golden, crossed by zigzag blue lines, each narrowly edged blackish. Marginal third of anal black. Males with 3 median caudal rays produced long as rest of fin. Length 86 mm. (Gilbert)

In the National Museum 5 Hawaiian specimens.

Callionymus cookii Günther.

Callionymus cookii Günther: Zool. Soc. London, Proc., p. 665, 1871 (type loc., Rarotonga, Cook Islands).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 192, pl. 113, fig. B, 1877 (type).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 324, 1911 (Fakarava, Paumotus).

Head (snout distended) 3 1/6; depth 6 3/4; D. IV-8; A. 7; snout 2 in head; eye 4; maxillary 2 3/4.

Body elongate, well depressed forward, tail slender and tapering. Caudal peduncle compressed, least depth 3 in its length or 4 in head. Head depressed, width 1 1/2 in its length. Snout attenuated, width at front of eyes equals its length. Eyes superior, within front half of head, diameter less than snout. Mouth small, inferior, lower jaw shorter. Maxillary reaches eye. Narrow band of fine feeble teeth in each jaw. Nostril simple pore close before eye. Interorbital very narrow bony keel, grooved above. Preopercle spine long as eye, its inner edge finely serrate. Gill opening much less than eye. Skin smooth. Lateral line superior along back. First dorsal spine 1 3/5 in head; last dorsal ray long as head as measured to end of preopercle spine; last anal ray long as head measured to gill opening; caudal 1 4/5 in combined head and trunk; pectoral equals head to gill opening; ventral equals head to tip of preopercle spine.

Pale isabella-color, becoming whitish on under surface. Back with 5 obscure isabella-color saddles, with smaller alternate spots along middle of side. Also back with obsolete mottlings of dark isabella-color in pale areas. Cheek with 5 oblique whitish streaks or lines sloping downward and forward. Iris pale flesh-pink, with some neutral-gray shadings. Spinous dorsal whitish, first membrane with few obsolete pale brown spots, second and third membranes with 2 dull lines transversely or obliquely downward posteriorly. Soft dorsal and anal whitish. Caudal whitish, with 6 brownish transverse bands. Pectoral and ventral very pale brownish. Length 57 mm.

In the Agassiz Museum 1 from Fakarava. Also 1 in the National Museum from Fakarava.

Callionymus corallinus Gilbert.

Callionymus corallinus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 649, fig. 251, 1903 (1905) (type loc., Avau Channel between Maui and Lanai in 32 to 37 fathoms).

Head 2 2/3; depth 5 1/4; D. IV-9; A. 8. Preopercular spine with 6 or 7 strong curved spinelets above, evenly and closely spaced. Dorsal spines not filamentous, less than caudal, which also shorter than head. Greenish-olive above, white below. Ventral with broad black basal bar and another at tip. Length 40 mm. (Gilbert)

Synchiropus lineolatus (Valenciennes).

Callionymus lineolatus Valenciennes: Hist. nat. Poiss., vol. 12, p. 229, 1837 (type loc., Pondicherry).—Günther: Cat. fishes Brit. Mus., vol. 3, p. 149, 1861 (type of *Callionymus lateralis* Richardson).—Peters: Akad. Wiss. Berlin, Monatsb., p. 841, 1876 (1877) (Bougainville Island in 40 fathoms).

Callionymus lateralis Richardson: Voyage "Sulphur," Fishes, p. 65, pl. 37, figs. 5-6, 1844 (type loc., Pacific).

Head 3 1/2; depth 5 1/3; D. IV-8; A. 7 or 8. Preopercular spine long as orbit, with 2 teeth on external third of its inner side. First dorsal in male elevated, 2 2/3 in combined head and body and tips of spines free filaments; in female 1/3 less in height. Across back 5 or 6 grayish bands. Mouth and head below scarlet. Over upper half of first dorsal 3 or 4 irregular transverse white spots with dark edges, also some round ones; in female only round spots usual. Caudal and ventral with 3 oblique brown bands. Anal red, with dark edge, and 2 or 3 blue, white or blue-edged spots behind each ray. Reaches 100 mm. (Day)

Reunion, India, Melanesia.

Synchiropus microps (Günther).

Callionymus microps Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 192, pl. 113, fig. C, 1877 (type loc., Tonga Islands).

Head 3; depth 5; D. IV-8; A. 7. Eye small, shorter than snout, 1 2/5 in interorbital. Preopercle ends in 2 spines. Spinous dorsal lower than soft dorsal, which little higher than body depth. Body and fins dark-brown, marbled with gray and white. First dorsal entirely black. Ventral brown and white. Length 77 mm. (Günther)

Synchiropus lili Jordan and Seale.

Synchiropus lili Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 415, pl. 53, fig. 2, 1905 (1906) (type loc., Apia).

Head 3; depth 5; D. IV-8; A. 7. Eye long as snout, 3 1/2 in head. Interorbital equal to pupil. Preopercle spine with 2 strong curved spines. Spinous dorsal lower than soft dorsal, which high as body depth. Dark brown, white below. Back with 3 wide irregular whitish bands. Along lower side 3 round white spots and few small white dots scattered about. Small blue dots over cheeks. Four black ocelli on upper half of spinous dorsal. Pectoral pale. Caudal and ventral with 2 dark broad bands. Length 34 mm. (Jordan and Seale)

PARAPERCIDAE

Bembrops filifera Gilbert.

Bembrops filifera Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 643, pl. 84, 1903 (1905) (type loc., off Maui in 143 to 202 fathoms).

Head 2 2/3; depth 7 3/4; D. VI-14 or 15; A. 17 or 18; scales 59 to 65 in lateral line, 7 above, 4 below; snout 3 1/10 in head from snout tip; eye 4 3/5; maxillary 3, with long narrowly triangular fleshy flap behind. Teeth in villiform bands, inner longer, curved and depressible; 2 patches on vomer. Gill rakers 13 below, slender. First dorsal spine ends in filamentous tip, length 2 in head. Light olive brown, grayish on head above. On lower half of side 9 conspicuous purplish-dusky bands, diffusely forked above, narrower than interspaces, obliquely down and forward nearly to anal base. Front half of spinous dorsal black. Length 223 mm. (Gilbert)

Chrionema chryseres Gilbert.

Chrionema chryseres Gilbert: U. S. Fish Comm.,

Bull., vol. 23, pt. 2, p. 645, pl. 85, 1903 (1905) (type loc., off Oahu in 183 to 264 fathoms).

Chrionema squamiceps Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 646, pl. 86, 1903 (1905) (type loc., off Maui in 95 to 152 fathoms).

Head 2 4/5; depth 6 7/8; D. VI-16; A. 24; scales 72 to 76, 12 above, 6 below; snout 3 2/5 in head from snout tip; eye 4; maxillary 2 2/5. Teeth in villiform bands in jaws, on vomer and palatines. Gill rakers 14 on lower branch. Spinous dorsal little lower than front of soft dorsal. Olive above, finely mottled darker brown. Along sides, little low, 4 large dusky blotches and smaller darker blotches in interspaces. Scattered yellow spots on back. Lower surfaces uniform whitish. Length 206 mm. (Gilbert)

Chrionema squamiceps is based on a specimen 61 mm. long. Its alleged characters of the shorter anal fin, more complete squamation of the head and coloration suggest immaturity.

Neopercis roseoviridis Gilbert.

Neopercis roseoviridis Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 643, pl. 83, 1903 (1905) (type loc., off Maui in 99 to 106 fathoms).

Head 3 2/5; depth 4 4/5; D. V, 23; A. 20; pores 55 to 57 in lateral line, 5 scales above to soft dorsal origin, 14 below; snout 4 4/5 in head; eye 2 1/2; maxillary 2 7/8. Narrow bands of villiform teeth in jaws, outer series enlarged; single series on vomer and palatines. Light rose above, crossed by 5 pairs of broad brownish-green bars and single narrower dark bar across nape. No black caudal spot. Spinous dorsal largely black. Caudal with 3 diffuse crossbars medially. Length 71 mm. (Gilbert)

Parapercis cylindrica (Bloch).

Sciaena cylindrica Bloch: Nat. ausländischen Fische, pt. 6, p. 42, pl. 299, fig. 1, 1792 (no type locality).

Percis cylindrica Günther: Cat. fishes Brit. Mus., vol. 2, p. (239) 525, 1860 (Aneiteum).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 16, 1869 (Kanathia).

Parapercis cylindrica Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 38, 1878 (New Guinea).—Weber: Siboga Exped., vol. 65, p. 519, 1913 (off New Guinea in S. Lat. 1° 42′.5 E. Long. 130° 47′.5 in 32 m.).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 148, 1913 (Saonek, Waigiu).

Head 4 1/3 to 4 2/3 in total; depth 5 1/3 to 6 1/2; D. V, 21; A. 18; scales 50. Third and fourth dorsal spines rather longer than premaxillary. Ventrals rather long, reach fifth anal ray. Body with 9 or 10 crossbands. Brown band from eye to throat. Interopercle spotted yellow and brown. Dorsal spines blackish. Soft dorsal and anal spotted whitish and brown, caudal with black. (Günther)

East Indies, Philippines, China, Queensland, Melanesia, Polynesia.

Parapercis hexophthalma (Cuvier).

Percis hexophthalma (Ehrenberg) Cuvier: Hist. nat. Poiss., vol. 3, p. 202, 1829 (type loc., Massaua, Red Sea).—Thiollière: Fauna Woodlark, p. 211, 1857 (Woodlark Island).—Günther: Cat. fishes Brit. Mus., vol. 2, p. 239, 1860 (Louisiades).—Schmeltz: Mus., Godeffroy, Cat. 4, p. 16, 1869 (Kandavu).—Günther: Cruise of "Curaçoa" (Brenchley), p. 409, 1873 (Solomons).—Günther: Rept. voyage "Challenger," vol. 1, p. 35, 1880 (Levuka, Fiji).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 102, pt. 1, p. 238, 1893 (New Hebrides).

Parapercis hexophthalmus Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 281, 1868 (Doreh, New Guinea).

Pinguipes didikuar (Montrouzier) Thiollière: Fauna Woodlark, p. 221, 1857 (name in synonymy).

Percis cancellata Günther: Cat. fishes British Mus., vol. 2, p. 240, 1860 (Louisiades).—Günther: Cruise of "Curaçoa" (Brenchley), p. 410, 1873 (Solomon Islands).

Percis cephalopunctatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 124, 1900 (type loc., Guam).

Differs from *Parapercis cylindrica* in its more slender body, fewer dorsal rays (18), smaller scales (62), ventrals shorter (nearly or quite to anal) and coloration. Along side of belly 3 or more white rings with black centers.

A specimen in the Agassiz Museum 158 mm. from the Society Islands obtained by Andrew Garrett. Five dark white-bordered ocelli along body above anal. Side of head with 7 white oblique lines. In the National Museum 2 specimens obtained by the Wilkes Expedition, 205 and 230 mm., the smaller from Fiji and the larger without locality, though likely from Polynesia? The Bishop Museum has the 3 types of *Percis cephalopunctatus*, 107 and 144 mm. long.

Red Sea, East Indies, Melanesia, Micronesia, Polynesia.

Parapercis tetracanthus (Bleeker).

Percis tetracanthus Bleeker: Nat. Tijds. Ned. Ind., vol. 4, p. 458, 1853 (type loc., Batavia, Java).—Günther: Cat. fishes Brit. Mus., vol. 2, p. 241, 1860 (Fiji).—Kner and Steindachner: Akad. Wiss. Wien, Sitz., vol. 54, pt. 1, p. 362, fig. 18, 1866 (Samoa).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 158, pl. 93, fig. B, 1876 (Pelew Islands; Samoa; Fiji; Society Islands).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma).—Garman: Mus. Comp. Zool., Bull., vol. 39, p. 233, 1903 (Suva, Fiji).

Percis tetracantha Schmeltz: Mus. Godeffroy, Cat. 4, p. 16, 1869 (Viti Levu).—Schmeltz: op. cit., Cat. 5, p. 26, 1874 (Viti Levu; Tahiti; Rarotonga).

Parapercis tetracanthus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 414, 1905 (1906) (Apia).

Distinguished chiefly by its grayish color with 3 longitudinal rows of paler blotches, each traversed by about dozen dark transverse crossbands. These so arranged that upper series more or less alternates with 2 lower. Caudal with posteromedian whitish blotch, rest of fin dotted dusky.

In the National Museum 2 from Fiji, 130 and 135 mm., obtained by the Wilkes Expedition. Also 3 from Apia through the Bureau of Fisheries. In the Agassiz Museum 1 from Suva reef and 1 from the Society Islands, 140 and 152 mm.

East Indies, Micronesia, Polynesia.

Parapercis schauinslandii (Steindachner) (Pl. XLIII, *A*).

Percis schauinslandii Steindachner: Akad. Wiss. Wien, Anz., vol. 16, p. 175, June 27, 1900 (type loc., Honolulu).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 496, pl. 3, fig. 5, 1901 (Honolulu).

Parapercis schauinslandii Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 15, 16 (Hilo; Honolulu).

Osurus schauinslandii Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 505, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 536, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 475, fig. 209a. 1903 (1905) (Honolulu; Hilo).

Osurus schauinslandi Jordan and Jordan: Carnegie Mus. Mem., vol. 10, no. 1, p. 79, Dec. 1922 (Hawaii).

Parapercis pterostigma Jenkins: U. S. Fish Comm.,

Bull., vol. 19, p. 402, fig. 15, 1899 (1901) (type loc., Honolulu).

The Bishop Museum has 15 from Honolulu and 1 from Hilo, 98 to 142 mm. long. In the National Museum 12 Hawaiian specimens and the type of *Parapercis pterostigma.*

Osurus Jordan and Evermann was framed as a new genus for this species on account of its deeply lunate caudal fin.

Parapercis xanthozona (Bleeker).

Percis xanthozona Bleeker: Bataviaasch Genoot., Verh. (Percoid.), vol. 22, p. 55, 1849 (type loc., Batavia, Java).

Parapercis xanthozona Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 86, 1906 (Shortland Island).

Head 3 1/3; depth 5; D. V, 21, 1; A. I, 17, 1; P. 1, 16; V. I, 5; scales 61 in lateral line to caudal base and 4 more on latter; tubes 58 in lateral line to caudal base and 3 more on latter; 7 scales above lateral line, 12 below; 12 predorsal scales to occiput; snout 3 in head measured from upper jaw tip; eye 4 1/2; maxillary 2 3/5; interorbital 2 1/3 in eye.

Body slenderly elongate, subcylindrical, rather depressed forward and compressed behind, deepest about middle of pectoral. Caudal peduncle strongly compressed, length 1 1/4 in its least depth, which 3 3/5 in total head length.

Head depressed, depth 1 1/8 in its greatest width, width 1 2/3 in head length, and upper profile little more inclined. Snout broad, convex, width at front of eyes slightly greater than length. Eyes superior, center about midway in head length; 1 1/2 in snout. Mouth little inclined from horizontal, mandible protruding. Maxillary reaches eye; expansion 3 in eye. Teeth in jaws fine, in bands, at least anteriorly; above, outer row enlarged, strong; below about 4 medio-laterals, enlarged, graduated up to last which largest and recurved, then followed by row of fine uniform even teeth. Tongue pointed, depressed, slender, free in front. Upper lip broader than lower. Front nostril at last third in snout, small, with short simple tube; hind nostril simple pore, nearer anterior. Interorbital narrow, slightly concave. Opercle with spine, and firm marginal point below.

Gill opening extends forward in last third in head. Gill rakers 6 + 12, obtuse, clavate, 2/5 of gill filaments, which 2 in eye.

Scales with 12 basal radiating striae; apical denticles 38 to 40, basal elements in 1 to 6 series; circuli fine. Muzzle and top of head to nape largely naked. Cheek with 12 rows of scales below eye. Scales on trunk in longitudinal rows. Caudal base scaly. Lateral line of small simple tubes, straight from shoulder to caudal base medially.

Spinous dorsal begins slightly behind head, fourth spine longest or 4 1/3 in total head length and fifth about long as first. Soft dorsal uniformly high, tip of last ray reaching caudal base, tenth ray 2 3/5 in head. Anal origin midway between mandible tip and caudal base, like soft dorsal, fifth ray 2 9/10 in head. Caudal double-concave behind, ending in 3 rather wide points, 1 3/4 in head. Pectoral reaches opposite anal origin, 1 3/4 in head. Ventral inserted little before pectoral origin, reaches vent, 1 3/5 in head. Vent close before anal.

Color in alcohol pale brownish generally. Back with 9 dark brown saddles. On lower side 10 vertical short dark brown bars. Head mottled with dark brown above and 2 dark brown bars below eye, dark blotch behind. Lips with 3 brown crossbars. Small black spot on opercle below, brown spot behind opercular spine and brown blotch behind preopercle edge. Basal brownish spot on each anterior membrane of spinous dorsal. Soft dorsal and caudal pale, former with 3 rows of round black spots, those of lowest row largest. Caudal pale like soft dorsal, with 2 converging rows of blackish spots, these made up of 7 vertical parallel series in each, last of which marginal on caudal. Anal pale, with median row of fine black spots, one on each membrane of fin. Iris slaty. Length 148 mm.

One in the Bishop Museum from Shortland Island.

Pteropsaron incisum Gilbert.

Pteropsaron incisum Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 647, pl. 87, 1903 (1905) (type loc., off Laysan Island, in 220 fathoms).

Head 3 1/10; depth 7 1/3; D. V-17; A. 22; scales 30 in lateral line, 2 above, 2 below; snout 4 1/4 in head; eye 3 1/10; maxillary 2 2/5. Teeth villiform, in very narrow bands in jaws, and small patch on each lateral part of vomer. Gill rakers 10 tubercles on lower branch. Spinous dorsal little lower than soft dorsal. Light gray or brown above. Opercle, head below, ventrals and anal with white. Spinous dorsal black, with white filamentous tip to first spine. Length 52 mm. (Gilbert)

Paratype in National Museum.

TRICHONOTIDAE

Kraemeria samoensis Steindachner (fig. 68).

Kraemeria samoensis Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1409, July 12, 1906 (type loc., Samoa).

Vitreola sagitta Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 393, pl. 37, fig. 1, December 15, 1906 (type loc., Pago Pago).

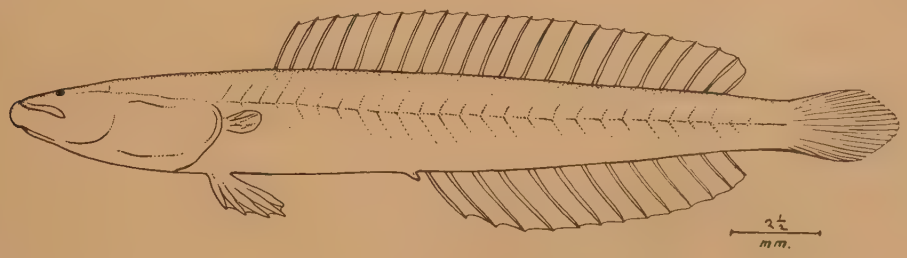

FIGURE 68.—Drawing of *Kraemeria samoensis.*

Head 3 1/2 to 4; depth 7 to 8; D. 19 or 20; A. 13 or 14; snout 4 to 5 1/5 in head measured from upper jaw tip; eye 10 to 12; maxillary 3 1/2 to 4; interorbital 11 to 12.

Body compressed, elongate, moderately deep, deepest about vent. Head width 3 to 3 1/4 in its total length. Snout rather depressed, long as wide. Eye small, hind edge at first third in total head length; diameter 2 to

2 1/2 in snout, little greater than interorbital. Mouth moderate, little inclined from horizontal; mandible broadly protruded in front, symphyseal length 3/5 of snout. Maxillary small, slender, reaches eye. Teeth apparently uniserial in jaws, minute, simple, conic. Tongue with slight median notch in front. Interorbital extremely narrow. Preopercle edge with few obsolete points. Gill opening forward midway in head. Skin smooth, scaleless. Fifth dorsal ray 3 1/4 to 3 1/2 in head; third anal ray 2 1/2 to 3; caudal 1 2/5 to 1 2/3, convexly rounded behind; pectoral 4 to 5; ventrals separated, 2 to 2 1/5; least depth of caudal peduncle 3 3/5 to 4 1/4.

Uniform pale brownish, without traces of pigment dots. Fins all pale, transparent.

Steindachner gives the D. 17 to 20 and A. 14 or 15. It is quite evident that *Vitreola sagitta* Jordan and Seale belongs in this family and not in the Gobiidae, in which they place it. Further their specimen had the dorsal torn after the fifth ray. Their attempt to place with the Eleotridae was due to the separate ventrals. The species is very small, transparent, and lives in the wet sand just at the edge of the tide, all of our specimens taken with specimens of *Crystallodytes cookei*. With the type of *Crystallodytes cookei* 5 specimens 20 to 26 mm. long from Laie Beach. Also 10 specimens from the same locality by C. Montague Cooke III, on June 4, 1923. One from French Frigates Shoal 26 mm. in June, 1923. Finally 17 were obtained at Malaekahana, Oahu, May 30-31, 1926, by C. Montague Cooke, Jr., and C. M. Cooke III. Quite likely *Psammichthys nudus* Regan (Linn. Soc. London, Trans., 2nd ser., vol. 12, Zool., pt. 3, p. 246, pl. 31, fig. 1, May, 1908) from sand-siftings at Praslin Reef, Seychelles Islands, is the same. In any event, *Vitreola* and *Psammichthys* are synonyms.

Crystallodytes cookei Fowler (fig. 69).

Crystallodytes cookei Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 391, 1923 (type loc., Laie Beach, Oahu).

Head 4 1/3 to 4 2/5; depth 10 1/2 to 10 3/4; D. 35 or 36; A. 34 or 35; pores in lateral line 47 to 55; snout 4 to 4 3/5 in head; eye 5 1/5 to 6; maxillary 2 1/8 to 2 1/4.

In the original description the body is said to be naked, which is true with the exception of the lateral line, it forming a continuous chain of small scales; a pore and tube to each scale, these large and conspicuous. Moreover the lateral line becomes inferior along the lower side of the tail on the caudal peduncle, reaching the bases of the lower caudal rays. Most all fin rays simple, only several of caudal divided. The pointed snout and head strongly suggest *Synodus*.

In this connection I have reexamined the type and subsequent specimens in the Bishop Museum. The type, No. 3400, Laie Beach, Oahu, November 2, 1923, obtained by Charles Montague Cooke, Jr., and C. M. Cooke III. Length 30 mm. Also 4 specimens from same locality June 4, 1923, by C. Montague Cooke, Jr. These 28 to 38 mm. Finally 10 fine specimens from Malaekahana, Oahu, May 30-31, 1926, C. Montague Cooke, Jr., and C. M. Cooke III. A female 41 mm. long, with swollen abdomen, gravid with eggs.

AMMODYTIDAE

Bleekeria gillii T. B. Bean (fig. 70).

Bleekeria gillii T. H. Bean: U. S. Nat. Mus., Proc., vol. 17, p. 629, 1894 (no type locality) (probably Pacific in Bonin Islands?).—Fowler: B. P. Bishop Mus., Bull. 26, p. 27, 1925 (Pearl and Hermes Reef).

One in the Bishop Museum from Pearl and Hermes Reef in 1923.

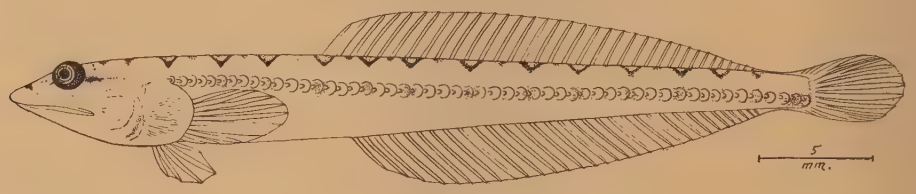

FIGURE 69.—Drawing of *Crystallodytes cookei*.

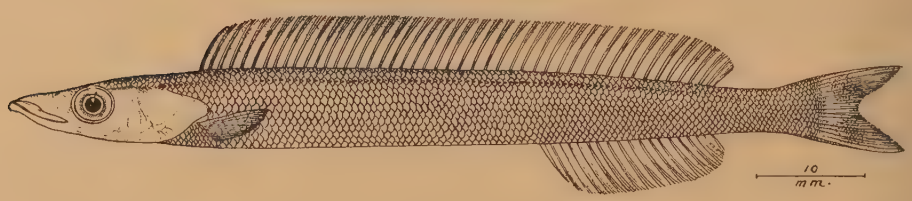

FIGURE 70.—Drawing of *Bleekeria gillii*.

OPISTHOGNATHIDAE

Opisthognathus papuensis Bleeker.

Opisthognathus papuensis Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 333, 1868 (type loc., Waigiu).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 158, 1876 (South Sea).

Head 3 1/3; depth 5; D. XII, 16 or 17; A. III, 14 or 15; lateral line 110; eye 3 1/4 to 3 1/3 in head; maxillary 1 2/3; interorbital concave, less 1/4 eye diameter across. Predorsal and thorax naked. Caudal rounded obtusely. Rose-green above, below rose-silvery. Head and body with large and small black dots. Fin-

rays with membranes rose-gold, dorsal and anal margined broadly against brown. Dorsal and anal with few black dots. Pectoral with numerous dots. Iris yellow, margined brown. Length 250 mm. (Bleeker)

Gnathypops samoensis Fowler and Silvester.

Gnathypops samoensis Fowler and Silvester: Carnegie Inst., Marine Pap., p. 118, fig. 1, 1922 (type loc., Aua Village, Samoa).

Known from the types, 2 specimens 55 to 61 mm. long in the Academy.

CHAMPSODONTIDAE

Champsodon guentheri Regan.

Champsodon guentheri Regan: Linn. Soc. London, Trans., vol. 12, p. 244, 1908 (type loc., Philippines; Nares Harbor, Admiralty Islands).

Champsodon vorax (non Günther 1876) Günther: Rept. voyage "Challenger," vol. 1, p. 56, 1880 (outside Nares Harbor, Admiralty Islands, in 152 fathoms).

According to Regan differs from all the other species of the genus in the premaxillary without interior notch. Maxillary extends from vertical of hind eye edge or little beyond. Length 140 mm.

Champsodon arafurensis Regan.

Champsodon arafurensis Regan: Linn. Soc. London, Trans., vol. 12, p. 245, 1908 (type loc., Arafura Sea and Ki Islands, 129 fathoms).—Weber: Siboga Exped., vol. 65, p. 146, 1913 (Waigiu).

Head 3 1/3 to 3 1/2; depth 5; D. IV or V-I, 18 or 19; A. I, 17; snout 1 1/4 to 1 1/2 long as eye, which 4 1/2 to 5 in head and greater than interorbital. Premaxillaries with double notch anteriorly. Maxillary not reaching beyond hind eye edge, length 3/5 of head. Preopercle spine moderate. Gill rakers 9 to 11 on lower branch of first arch. Second dorsal spine little over 1/3 of head; distance between dorsal origins 2/5 of space from snout tip to spinous dorsal origin. Anal origin nearly midway between snout tip and caudal base. Ventral little shorter than head, reaches anal origin. Silvery, back darker. Upper parts of spinous dorsal sometimes blackish. Length 75 mm. (Regan)

Champsodon fimbriatus Gilbert.

Champsodon fimbriatus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 648, pl. 88, 1903 (1905) (type loc., Pailolo Channel in 122 to 143 fathoms).

Head 3; depth 4 1/2; D. IV or V-18 to 20; A. 16 to 18; snout 3 2/3 in head from snout tip; eye 5 1/4; maxillary 1 1/2; interorbital 3 1/2. Gill rakers 2 + 12. Dusky brownish on back, with 3 faint, broad, dark cross bars. Sides and below silvery, speckled with brownish. Fins uniform whitish. Length 80 mm. (Gilbert)

According to Regan like *C. arafurensis* in the double notch anteriorly in premaxillaries. It differs in the space between dorsal origins less than half of space from snout tip to spinous dorsal origin.

URANOSCOPIDAE

Anema monopterygium (Schneider) has been reported from the tropical Pacific Ocean as *Uranoscopum maculatum* by Lichtenstein (Descriptiones animalium, Forster, p. 155, 1844). This species is known only from New Zealand so the reference does not refer to the limits of Oceania.

Uranoscopus sulphureus Valenciennes.

Uranoscopus sulphureus Valenciennes: Hist. nat. Poiss., vol. 8, p. 365, 1831 (type loc., Friendly Islands).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 157, 1876 (copied).

Uranoscopus fuscomaculatus Steindachner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, pp. 28, 319, 1868 (type loc., Kandavu, Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 16, 1869 (Kandavu).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 157, 1876 (Kandavu).—Günther: Rept. voyage "Challenger," vol. 1, p. 43, 1880 (Arafura Sea).

Head 3; D. III-13; A. 13. Preorbitals and suborbitals without produced spines. Preopercle with 5 spines on edge. Shoulder spine not 2/5 pectoral and strongly forked longitudinally. Dark brown, with 2 or 3 longitudinal rows of large and small dark brown spots. On side similar, but smaller spots. First dorsal black. Length 164 mm. (Günther)

Very likely *Uranoscopus sulphureus* is the same species. It was apparently based on a specimen faded sulphur-yellow 305 mm. long. It is described with 5 dorsal spines, oblong suborbital slightly emarginate and without prominent spines, lower preopercle edge with 5 spines, broad flat cranium granular and with keels little developed, posteriorly scalloped; also shoulder spine strong, wide and deeply forked.

East Indies, Polynesia.

BLENNIIDAE

Enneapterygius hemimelas (Kner and Steindachner).

Tripterygium hemimelas Kner and Steindachner: Akad. Wiss. Wien, Sitz., vol. 54, pt. 1, p. 371, 1866 (type loc., Samoa).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 29, 1874 (Samoa).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1412, 1906 (Samoa).

Tripterigium hemimelas Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 210, 1877 (Samoa).

Enneapterygius hemimelas Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 416, 1905 (1906) (Apia; Pago Pago).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 28, 1925 (Laysan, French Frigates Shoal, Johnston islands.)—Fowler: op. cit., Bull. 38, p. 29, 1927 (Howland and Laysan islands).

Tripterigion atriceps Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 595, fig. 46, 1902 (1903) (type loc., Honolulu).

Enneapterygius atriceps Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 496, fig. 219, 1903 (1905) (Honolulu; Waikiki reef).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 325, 1911 (Ponapé, Carolines).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 28, 1925 (Laysan Island).

Enneapterygius atripes Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 82, Dec. 1922 (Hawaii) (name on Jenkins).

Head 2 7/8 to 3 1/4; depth 4 2/5 to 4 1/2; D. III, XIV, 9; A. I, 17 or 18; scales 18 to 22 in upper section of lateral line, 12 to 17 in lower section to caudal base and 2 more on latter; 3 scales above lateral line, 5 or 6 below; snout 3 1/2 in head measured from upper jaw tip; eye 2 1/2 to 2 4/5; maxillary 2 1/4 to 2 1/3; interorbital 2 in eye. Scales with 8 to 11 basal marginal striae; apical denticles 9 to 26; circuli few. Head with numerous close-set dusky or brownish spots.

In the Academy 3 from Honolulu, 19 to 22 mm. The Bishop Museum has 2 from Honolulu and 4 from Waikiki obtained by C. H.

Edmondson in 1922. Also 2 from Laysan, 1 from French Frigates Shoal, and 3 from Wake Island in 1923. The type of *Triptcrigion atriceps* in the National Museum, besides 6 other Hawaiian specimens and 1 from Ponapé. The Agassiz Museum has 3 Hawaiian specimens. In the National Museum 3 from Samoa.

Micronesia, Polynesia, Hawaii.

Enneapterygius minutus (Günther).

Tripterigium minutus Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 211, pl. 118, fig. D, 1877 (type loc., Apia).

Tripterygium minutum Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1412, 1906 (Apia).

Enneapterygius minutum Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 416, 1905 (1906) (Apia).

Enneapterygius minutus Fowler: B. P. Bishop Mus., Bull. 38, p. 29, 1927 (Howland Island).

Enneapterygius tusitalae Jordan and Seale: (U. S.) Fish. Bur., Bull., vol. 25, p. 416, fig. 97, 1905 (1906) (type loc., Pago Pago; Apia).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 125, 1922 (Pago Pago).

Enneapterygius pardochir Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 419, fig. 101, 1905 (1906) (type loc., Apia; Pago Pago).

Enneapterygius tutuilae Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 418, fig. 99, 1905 (1906) (type loc., Pago Pago).

Enneapterygius cerasinus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 419, fig. 100, 1905 (1906) (type loc., Apia).

Enneapterygius hudsoni Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 419, fig. 101, 1905 (1906) (type loc., Apia).

Head 3 1/5 to 3 1/3; depth 4 1/4 to 4 1/2; D. III, XII, 6 to 9; A. I, 15 to 19; scales 27 or 28 in median lateral series to caudal base and 3 more on latter; lateral line only of 10 to 12 tubes anteriorly; 7 or 8 scales transversely; snout 3 to 3 1/5 in head; eye 2 4/5 to 3 1/10; maxillary 2 3/5 to 2 3/4; interorbital 1 1/2 in eye. Scales with 8 or 9 marginal basal striae; apical denticles 19 to 21; circuli few. One example shows cheeks deep dusky-brown.

In the Academy 6 from Pago Pago, 20 to 23 mm. One in the National Museum from Apia.

The various nominal species described by Jordan and Seale appear to be variants of this species.

Sauvagea caledonica (Sauvage).

Lepidoblennius caledonica Sauvage: Rev. Mag. Zool., p. 338, 1874 (type loc., New Caledonia).

Head 4 1/2; depth 7; D. VIII, 25; A. 26. Body uniformly elongate. Profile of head little inclined. Snout short. Eye large, next to upper profile, 3 1/2 in head. Mouth nearly reaches eye. Row of strong fixed teeth in jaws, and pair of slightly enlarged, anterior, curved mandibular teeth. No teeth on palate. Mandible protruding. Gill opening very narrow, vertical. Head naked. Scales very small, cycloid, caducous. Dorsals continuous, radii simple. Anal more developed than second dorsal. Caudal free, truncate. Paired fins shorter than head. Olive-brown. Caudal tipped golden brown. (Sauvage)

Cristiceps roseus Günther.

Cristiceps roseus Günther: Cat. fishes British Mus., vol. 3, p. 274, 1861 (type loc., Freycinet's Harbor; New Guinea and islands; Gages Road, Swan River).

Head 4 2/5 in total; depth 5; D. 3-25 or 26, 4; A. II, 20 or 21. Snout subconic, equals eye. Lower jaw prominent. Teeth on vomer, none on palate. Interorbital much less than vertical eye diameter. Well developed tentacle above orbit, with obtuse fringes; nasal tentacle fringed. Scales rudimentary. Detached dorsal on nape, above opercle, higher than second dorsal; last dorsal ray with membrane to caudal base. Anal free. Inner ventral ray half length of median one. Yellowish. Head, body and first dorsal marbled rose. Second dorsal, anal and pectorals with rose crossbars. Length 95 mm. (Günther)

East Indies, Australia, Melanesia.

Petroscirtes filamentosus (Valenciennes).

Blennechis filamentosus Valenciennes: Hist. nat. Poiss., vol. 11, p. 206, pl. 326, 1836 (type loc., New Guinea).

Petroscirtes filamentosus Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 196, pl. 114, fig. B, 1873 (New Guinea; Paumotus; Huahine).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 15, 1877 (Vavao; Paumotus).—Fowler: B. P. Bishop Mus., Bull. 38, p. 29, 1927 (Fanning Island).

Petroskirtes filamentosus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 517, 1900 (Hawaiian islands).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (same specimen).

Blennius rostratus (Solander) Valenciennes: Hist. nat Poiss., vol. 11, p. 206, 1836 (name in synonymy).

Head 3 3/5 to 3 2/3; depth 5 2/5 to 5 1/2; D. IV, 34; A. II, 25; snout 3 1/5 to 3 1/3 in head; eye 4; mouth width 4 1/4 to 4 2/5; interorbital 3 1/2 to 3 2/3.

Body elongate, well compressed, deepest at anal origin. Caudal peduncle well compressed, least depth 2 3/4 in head. Head width 2 2/5 in its length. Snout conic, well protruded, wide as long. Eye high, hind pupil edge slightly before middle in head length. Mouth transversely inferior. Teeth above 16, with 2 more moderate detached canines each side; 18 below, with large curved canine each side. Nostril small pore over front eye edge. Interorbital broadly convex. Gill opening 3 1/2 in head.

Skin smooth, apparently scaleless. First dorsal spine 1 1/6 to 1 1/5 in head; first dorsal ray 2 1/5; twenty-third anal ray 2 4/5; caudal 1 2/5; pectoral 1 3/5; ventral 1 2/5.

Brown generally, under surface of head and belly paler. Dark brown band from snout tip through eye, above pectoral base and thence to caudal where it widens out broadly to include most of caudal, leaving only upper and lower edges of latter narrowly whitish. Dorsals and anals dusky-brown. Pectoral brownish. Ventral dusky. Length 60 mm.

In the Agassiz Museum 1 from the Society Islands, obtained by Andrew Garrett. One in the Academy from Hawaii, obtained by W. H. Jones, 58 mm. long. It has much in common with Günther's figure. Jordan and Evermann have stated that the locality for this species is "probably not Hawaiian," though my specimen is labeled from the Hawaiian islands and is equally as rightfully a member of that fauna as most other sections of the Indo-Pacific. As most, if not all, the Jones fishes obtained in Oceania were collected at or near Honolulu, it is reasonably certain this one was. Until contrary evidence is forthcoming I refuse to suppress the

record. The absence of *Petroscirtes* from Hawaii would be merely an assumption at best.

East Indies, Polynesia, Hawaii.

Petroscirtes taeniatus (Quoy and Gaimard).

Aspidontus taeniatus Quoy and Gaimard: Voyage "Astrolabe," Zool., vol. 3, p. 719, pl. 19, fig. 4, 1834 (type loc., Agana, Guam; north New Guinea).

Petroskirtes taeniatus Schmeltz: Mus. Godeffroy, Cat. 4, p. 19, 1869 (Viti Islands).—Schmeltz: op. cit., Cat. 5, p. 29, 1874 (Viti; Tahiti).

Petroscirtes taeniatus Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 195, pl. 114, fig. A, 1877 (New Guinea; Carolines; Friendly Islands; Paumotu; Fiji; Tahiti).

Petroscirtes azureus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 432, fig. 109, 1905 (1906) (type loc., Apia).

Head 4; depth 4 1/2; D. 39; A. 26. Snout well produced over mouth cleft. Eye 3 7/8 in head, 1 2/5 in snout. Front dorsal rays not elongated, first 2 3/5 in head. Blue, with black lateral band from snout tip to eye, then broadening behind to caudal base and over greater part of caudal so that only upper and lower caudal edges blue. Dorsal and anal black with white edges. Length 128 mm. (Günther)

Petroscirtes azureus agrees with this species in every way, though is said to have 6 small barbels on the chin.

East Indies, Micronesia, Polynesia.

Petroscirtes atrodorsalis Günther.

Petroscirtes atrodorsalis Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 198, pl. 115, fig. B, 1877 (type loc., Samoa).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1412, 1906 (Samoa).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 433, pl. 53, fig. 3, 1905 (1906) (Pago Pago).

Petroscirtes xestus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, fig. 110, 1905 (1906) (type loc., Pago Pago).

Head 4 1/3; depth 4 1/4; D. 33; A. 18. Front profile of snout convex, somewhat shorter than eye, which 3 in head. Lower canines very large, upper moderately small. Interorbital level, width less than eye. Dorsal highest about first third, height 1 2/3 in head. Upper and lower prolonged caudal tips longer than rest of fin or 2 1/8 in combined head and body. Brownish-olive. Dorsal black, with pale broad margin. Length 64 mm. (Günther)

In the National Museum 1 from Samoa.

The species *Petroscirtes xestus* based on a specimen but 14 mm. long, is likely the young.

Petroscirtes elongatus Peters.

Petroscirtes elongatus Peters: Arch. Nat., vol. 1, p. 249, 1855 (type loc., Zanzibar; Mozambique).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 196, 1877 (Fiji).

Petroscirtes kallosoma Schmeltz: Mus. Godeffroy, Cat. 4, p. 19, 1869 (Viti Islands).

Petroscirtes oualensis Günther: Rept. voyage "Challenger," vol. 1, p. 35, 1880 (type loc., Ovalau, Fiji).

Petroscirtes germaini Sauvage: Soc. Philom. Paris, Bull., 7th ser., vol. 7, p. 158, 1882 (type loc., New Guinea).

Head 5 1/3; depth 6 1/2; D. 30 to 32; A. 20 to 24. Snout profile convex, not produced beyond mouth, scarcely long as eye. Interorbital depressed. Dorsal not elevated in front. Greenish-brown. Dark ocellus on gill cover. Dorsal with oblique lines and large brown blotch between 23rd and 25th rays. Reaches 100 mm. (Günther)

According to Peters the dorsal ocellus is absent in the female and the caudal is forked. *Petroscirtes kallosoma* Bleeker is a synonym, likewise *Petroscirtes oualensis* Günther. *Petroscirtes germaini* Sauvage is based on a specimen but 55 mm. long with rounded caudal.

Zanzibar, Mozambique, East Indies, Polynesia.

Petroscirtes obliquus Garman.

Petroscirtes obliquus Garman: Mus. Comp. Zool., Bull., vol. 39, p. 237, pl. 4, fig. 3, 1903 (type loc., Suva, Fiji).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 434, 1905 (1906) (Apia).

Head 4; depth 5; D. 31; A. 22. Snout rounded, blunt, half long as eye, which 3 in head and very prominent above forehead. Maxillary narrow. Maxillary reaches little below front part of eye. Teeth strong, fixed, uniserial; with very strong canines behind each series, lower little stronger and longer. Crown rising somewhat high on interorbital longitudinally and rather flattened transversely. Gill openings small, above pectoral bases. Posterior dorsal rays all longer. Caudal subtruncate, free from dorsal and anal. Light olivaceous-brown. Black spot behind eye and several transverse bands on head below. Series of brown bars on flanks, anterior inclined forward, posterior backward. Two spots at caudal base. Series of smaller spots near dorsal base. First dorsal clouded or spotted. Anal with spots along base and edge darker. Pectorals dusky. (Garman)

The type in the Agassiz Museum. One in the National Museum from Samoa.

Petroscirtes grammistes (Valenciennes).

Blennechis grammistes Valenciennes: Hist. nat. Poiss., vol. 11, p. 210, 1836 (type loc., Java, East Indies).

Petroscirtes grammistes Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 197, pl. 115, fig. F, 1877 (Yap).

Head 4 1/5; depth 4 1/5; D. 30; A. 16 to 18. Snout with front profile convex, shorter than eye, which 3 in head. Interorbital broad. Front dorsal rays not prolonged, first 2 1/8 in head. Whitish with 3 brownish-black longitudinal bands, upper along edge of back, median through eye and lower from mouth through pectoral base. Dorsal with row of large round black spots along upper edge and row of small dots along subbasal portion of posterior half of fin. Anal with 3 rows of black spots. Caudal spotted with black. Young with spots on fins less developed or as bands. Length 64 mm. (Günther)

East Indies, Micronesia.

Petroscirtes lineolatus Kner.

Petroscirtes lineolatus Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, pp. 29, 331, pl. 6, fig. 17, 1868 (type loc., Kandavu, Fiji).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 197, 1877 (Kandavu).

Petroscirtes kochi Weber: Nova Guinea, vol. 5, pt. 2, p. 263, 1908 (type loc., Merauke River, south New Guinea).

Head 6 3/4 in total; depth 7; D. 31; A. 21. Eye 4 in head, high, 1/3 diameter apart. Snout short, nearly vertical. Upper jaw longer. Teeth 26 to 28, fine, tips brown, canines below large. First 12 dorsal rays lower than posterior rays. Caudal rounded, 3/4 head. Pectoral shorter than head. Bluish-brown, with 9 crossbands below dorsal reaching midway in body depth. Front of dorsal with broad dark cross blotch. Three dark semicircles; one from eye to eye across lower jaw; second from eye to eye across isthmus; third from opercle to opercle. Pectoral base with dark cross blotch. Dorsal, caudal and paired fins hyaline, first with median longitudinal dull band. Anal darker, edge broadly blackish. Length 50 mm. (Weber)

Evidently *Petroscirtes kochi* is the present species.

Petroscirtes mitratus Rüppell.

Petroscirtes mitratus Rüppell: Atlas Reise Nord. Afrika, Fische, p. 111, pl. 28, fig. 1, 1828 (type loc., Jubal Island, Red Sea).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 198, 1877 (Samoa).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 142, 1906 (Upolu).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 329, 1911 (Moen, Truk Group, Carolines).—Fowler: B. P. Bishop Mus., Bull. 22, p. 20, 1925 (Guam).

Petroscirtes longifilis Kner: Akad. Wiss. Wien, Sitz., vol. 54, pt. 1, p. 367, fig. 5, 1866 (type loc., Samoa).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 431, 1905 (1906) (Apia).

Head 3 1/2; depth 3 4/5; D. 26; A. 16; snout 3 1/4 in head; eye 3 1/4; maxillary 3; interorbital 5.

Body well compressed, deep. Caudal peduncle strongly compressed, least depth 2 2/3 in head. Head width 1 1/2 in its length. Snout obtusely convex, width 3/4 its length. Eye elevated, hind edge midway in head length; diameter greater than snout or interorbital. Mouth transverse, lower jaw slightly shorter; gape short. Teeth 28 in each jaw, compressed, close set, ends rounded and entire; canine each side above and below and lower pair larger. Front nostril at last 2/5 in snout; hind nostril close before upper front eye edge. Interorbital slightly concave. Gill opening half of eye.

Skin smooth. Supraorbital tentacle long as pupil. First dorsal spine 1 1/2 in head; fourth anal ray 2; caudal 1 1/5, emarginate; pectoral 1 1/4; ventral 1 1/4.

Faded pale brown with marblings of darker and lighter. Vertical fins all marbled or mottled with dusky-brown to whitish, somewhat as crossbars on caudal. Paired fins pale. Length 38 mm.

One in the Agassiz Museum from Truk, Caroline Islands. The National Museum has 1 from Apia and 4 from Moen.

Red Sea, Mombasa, Zanzibar, Mozambique, Mauritius, East Indies, Micronesia, Polynesia.

Petroscirtes maroubrae (Ogilby).

Macrurrhynchus maroubrae Ogilby: Linn. Soc. New South Wales, Proc., 2nd ser., vol. 11, p. 137, 1896 (1897) (type loc., Maroubra Beach, Sydney).

Aspidontus maroubrae McCulloch and McNeil: Australian Mus., Records, vol. 13, p. 23, 1918 (New Hebrides).

Head 4 3/5; depth 6 1/2; D. 43?; A. 32; eye 3 2/5 in head, slightly longer than snout. Teeth uniserial, fixed, flattened; no upper canines, lower large. Interorbital broader than eye, 3 1/10 in head. Caudal little emarginate. Brown, lighter below. Numerous brown bars on upper half of sides. Dorsal and anal with several dark bars and marginal band of same. Median caudal rays similarly dotted. Length 50 mm. (McCulloch)

New South Wales, Melanesia.

Petroscirtes quadrimaculatus Kendall and Goldsborough.

Petroscirtes quadrimaculatus Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 329, pl. 7, fig. 1, 1911 (type loc., Arhno Atoll, Marshall Islands; Papeete, Tahiti).

Head 3 3/4; depth 5 1/5; D. 40; A. 30; snout 3 4/5 in head; eye 3 4/5; maxillary 4 1/8; interorbital 3 4/5.

Body well compressed, elongate, deepest at front of dorsal. Caudal peduncle well compressed, least depth 2 3/4 in head. Head width 2 1/4 in its length. Snout obtuse, convex, long as wide. Eye with hind edge midway in head length; diameter equals snout or interorbital. Mouth transverse, lower jaw shorter, gape short. Teeth 16 above, with 2 small canines each side; below 16, with large curved canine each side. Front nostril with short cutaneous rim, at last third in snout; hind nostril simple pore above front rim of eye. Interorbital broad, but slightly convex. Gill opening equals eye. Skin smooth. Fourth dorsal ray 2 2/5 in head; fifteenth ray 1 7/8; tenth anal ray 2 1/5; caudal 2; pectoral 1 7/8; ventral 2 1/4.

Dull brownish generally, with median lateral silvery streak delimiting 9 dark brown blotches along side of back; opposite on dorsal similar number of dark blotches extending across fin to edge, pale interspaces whitish and much narrower than blotches. Caudal whitish, with brownish blotch basally. Also dark blotches similarly on anal. Brown blotch behind eye and another on opercle above. Iris silvery. Paired fins brownish. Length 44 mm.

One in the Agassiz Museum, paratype No. 29, 393, Papeete, Tahiti, obtained November 11, 1899.

Type and paratype from Arhno Atoll, in the National Museum.

Petroscirtes tapeinosoma Bleeker.

Petroskirtes tapeinosoma Bleeker: Nat. Tijds. Ned. Ind., vol. 2, p. 64, 1857 (type loc., Amboina).

Petroscirtes tapeinosoma Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 195, pl. 115, fig. D, 1877 (Apia).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1412, 1906 (Apia).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 89, 1906 (Faté; Raiatea; Nukuhiva).

Head 5; depth 6 3/5; D. 43; A. 30; snout 4 in head; eye 3 1/6; mouth width 3; interorbital 3 3/4. Least depth of caudal peduncle 2 3/4 in head. Head width 2 1/3 in its length. Tenth dorsal ray 2 1/4 in head; tenth anal ray 2 3/4; caudal 1 1/4; pectoral 2; ventral 1 3/4. Length 44 to 70 mm.

In the Bishop Museum 1 from Raiatea, 1 Nukuhiva and 1 Faté. The Agassiz Museum has 1 from Ponapé in the Caroline Islands, through Rev. L. H. Gulick, 65 mm. long.

Somewhat like *Petroscirtes rhinorhynchos* but with different coloration. Dorsal with broad blackish band its whole extent submarginally or for terminal half of fin. Dark median lateral band narrows at caudal base and extends to slender point at middle of fin. Anal dark, edge narrowly pale.

Red Sea, East Indies, Micronesia, Polynesia.

Petroscirtes rhinorhynchos Bleeker.

Petroskirtes rhinorhijnchos Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 273, 1852 (type loc., Wahai, Ceram).

Petroscirtes rhinorhynchus Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 195, pl. 115, fig. E, 1877 (Pelew Islands).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 89, 1906 (Faté).

Head 4 3/5; depth 6 4/5; D. 45; A. 32; snout 3 in head; eye 3 1/3; mouth width 2 3/5; interorbital 3.

Body uniformly elongate, compressed. Least depth of caudal peduncle 2 2/3 in head. Head attenuate, slightly compressed, width 2 in its length. Snout conic, length 4/5 its width. Eye large, high, hind pupil edge midway in head length. Mouth broadly transverse, inferior, falls opposite last third in snout. Teeth fine, even, uniserial in jaws. No canines. Lips even, entire. Interorbital broad, depressed or level. Gill opening lateral slit, little

inclined, 3/5 of eye. Skin smooth, naked; upper surface of head finely rugose. Dorsal begins at last fifth in head, ends at caudal peduncle, rather low, rays all similar, fine, flexible; tenth dorsal ray 3 2/5 in head. Anal like dorsal, begins at first 2/5 in combined head and trunk length; tenth anal ray 2 3/4 in head. Caudal emarginate behind, each lobe ends in sharp point, 1 1/5 in head. Pectoral low, median rays longest, reaches half way to anal, 1 2/3 in head. Ventral small, inserted at last fourth in head; 2 7/8 in head.

Color in alcohol livid dusky-gray. Dusky-brown band along dorsal edge of back and another from snout tip through eye to caudal base medianly, extending out on caudal base as black blotch. Third less distinct longitudinal brown band along lower side of head and trunk. Fins pale. Iris slaty. Length 56 mm.

One in the Bishop Museum from Faté.

East Indies, Melanesia, Micronesia.

Blennius tonganus Jordan and Seale.

Blennius tonganus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 420, 1905 (1906) (on Günther).

Blennius cristatus (non Linné) Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 194, pl. 113, fig. E, 1877 (Tonga).

Head 3 7/8; depth 3 7/8; D. XII, 15; A. II, 16: snout 2 1/2 in head; eye 4 3/4; maxillary 3; interorbital 2 in eye. Lips entire. Teeth uniserial, compressed, truncate, even, and small hind canine each side below. Trifid supraorbital tentacle about half of eye. Front nostril with short fringed flap about half of pupil. Median occipital row of fine filaments, about half of eye. Anal spines with dendritic fleshy tips.

Color in alcohol pale brown generally. On body 7 wide transverse brown saddle-like blotches, alternating below lateral line with similar though smaller blotches. Dorsal blotches all reflected along dorsal bases. Spinous dorsal with marginal and median cloudings of brown and soft fin with obscure oblique whitish lines or streaks. Caudal with 3 indistinct pale brown broad crossbands. Anal pale, each membrane with marginal pale dusky tinge, though tips of rays all whitish. Pectoral pale, with 2 dull obsolete basal crossbands of brown. Trunk posterior to vent with many minute whitish dots, crowded and conspicuous, a number extending on anal basally, especially behind, though not evident on other fins. Some whitish specks along back and head above, and some as streaks from lower hind eye edge. Length 105 mm.

One in the Academy labeled Pacific Ocean, though likely from somewhere in Polynesia?

Blennius snowi new species (fig. 71).

Head 3 7/8; depth 3 7/8; D. XII, 15; A. II, 16; A. II, 19; snout 2 7/8 to 3 in head; eye 3 1/6 to 3 1/2; maxillary 2 1/3 to 2 2/3; interorbital 2 1/4 to 2 4/5 in eye.

Body moderately long, well compressed, tail but slightly tapering. Caudal peduncle well compressed, least depth 3 1/5 in head.

Head compressed, width half its length. Snout very obtuse, convex over surface and front profile nearly vertical. Eye large, close within upper front profile, its hind edge at first 2/5 in head; diameter greater than snout length; supraorbital tentacle long, slender, equals eye diameter. Mouth broad, lower jaw shorter, width 3 in head. Maxillary extends back opposite hind eye edge. Lips entire. Teeth uniserial, firmly implanted in jaws; each side below moderate curved canine. Nostril close before lower front eye edge, without tentacle or flap. Interorbital narrowly concave.

Gill opening extends forward opposite middle of head, wide and membrane forming broad fold across isthmus. Gill rakers 2 + 8, short, feeble points, these greatly shorter than gill filaments, which half of eye.

Skin smooth, rather thin. Lateral line short, high, apparently not quite reaching far as pectoral end.

Fourth dorsal spine 1 1/2 in head, spines all rather flexible; fourth dorsal ray 1 4/5 and last one united to caudal peduncle by membrane for at least 2/3 its length; fourth anal ray half of head and last united with caudal peduncle by membrane for at least half its length; caudal with hind edge obliquely truncate, lower rays longest, fin equals head; pectoral rays 14, reaches vent, equals head; ventral rays 2, length 1 1/10.

Pale brown generally, trunk with some gray-white tints. Along side 7 broad whitish vertical blotches, anterior more forked below and less so above, rest quadrate. Opercles and branchiostegal region tinged with dusky. Row of small white spots or dots close behind and below eye edge; white dot on maxillary and row along preopercle; white spot below opercle and another at angle; 2 or 3 white blotches at pectoral base and row of fine white dots across fin near base. Iris silvery-white. Row of obscure dark blotches along bases of dorsals, alternating with smaller obscure whitish blotches; first membranes of spinous dorsal with terminal dusky blotch and greater basal portion white; spinous dorsal and soft dorsal with 2 or 3 irregular rows of small white dots on membranes. Caudal pale, with 3 or 4 irregular transverse rows of small dots on membranes. Anal pale, with narrow dusky margin. Pectoral pale. Ventral whitish. Length 37 to 41 mm.

Type No. 3634, Mus. Comp. Zool. Strong's Island, Caroline Islands. Rev. B. G. Snow. Also paratype, same data.

Blennius canescens Garman.

Blennius canescens Garman: Mus. Comp. Zool., Bull.,

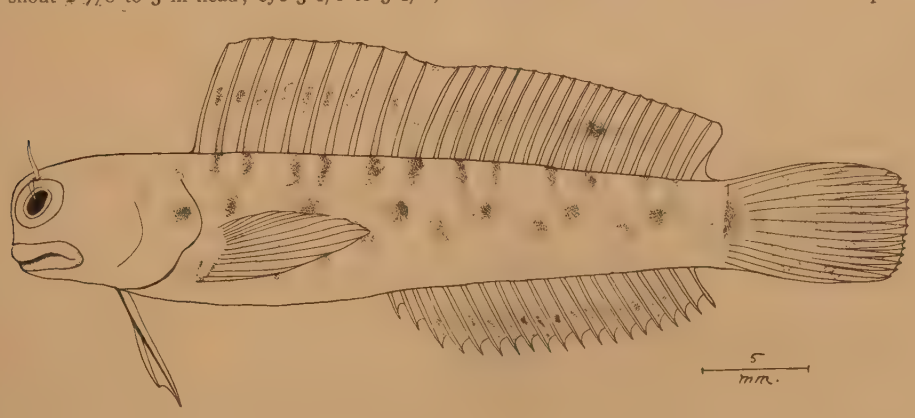

FIGURE 71.—Drawing of *Blennius snowi*.

vol. 39, p. 236, pl. 4, fig. 1, 1904 (type loc., Mbengha Passage, Fiji).

Head 3 1/3; depth 3 4/5; D. X, 16; A. 17. Muzzle pointed. Snout half of eye, which 3 in head. Short supraocular filament; also short nasal filament; no crest or filament on nape. Mouth little inclined. Maxillary reaches first fourth of eye. Two small upper symphyseal canines and larger on each of lower jaws. Dorsal notched, spines little shorter than rays. Caudal little shorter than head, slightly notched behind. Uniform light brown, white or yellow. Brown band across occiput from eye to eye. Brown spot above orbits. (Garman)

The type in the Agassiz Museum examined.

Blennius nativitatis Regan (Zool. Soc. London, Proc., pt. 1, p. 404, 1909, type loc., Christmas Island, Indian Ocean) is similar but is described with nuchal tentacles and 8 darker crossbars on side of body.

Blennius sordidus Bennett.

Blennius sordidus Bennett: Zool. Jour., vol. 4, p. 34, 1829 (type loc., Honolulu).—Valenciennes: Hist. nat. Poiss., vol. 11, p. 189, 1836 (Hawaiian islands).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 193, pl. 113, fig. D, 1877 (Hawaiian islands).

Head 3 1/2; depth 3 3/4; D. XII, 17; A. II, 19. Eye long as snout, 4 in head. Supraorbital tentacle moderately long and broad, end fringed. No canines. Dorsals united, notch but slight, last ray not joined with caudal. Caudal and pectoral shorter than head. Brownish, marbled dark on back. Dark blotch at front of spinous dorsal. Caudal with or without brown dots. Length 101 mm. (Günther)

Günther also reports it from Coquimbo.

Blennius atrocinctus Regan (Zool. Soc. London, Proc., pt. 1, p. 405, pl. 66, fig. 1, 1909, type loc., Christmas Island, Indian Ocean) appears to be the young, based on a specimen 27 mm.

Blennius rhabdotrachelus Fowler and Ball (fig. 72).

Blennius rhabdotrachelus Fowler and Ball: Acad. Nat. Sci. Philadelphia, Proc., p. 272, 1924 (type loc., Wake Island).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 28, 1925 (type).

Hypleurochilus periophthalmoides (Macleay).

Blennius periophthalmoides Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 269, 1883 (type loc., Dufaure Island, New Guinea).

Depth 6 in total, much compressed; D. XII, 16; A. 18; P. 14; V. 2. Head high as long, broader than long, quite round in front, with eyes very prominent, nearly together on top of head. Mouth terminal, extending to below middle of eye. Gill membranes entirely united below. Dorsal distinctly notched. Caudal rounded. Pectoral strong, rays simple. All fins marked with alternate brown and white bars, giving spotted appearance. Body inky-drab. (Macleay)

Cirripectes brevis (Kner) (Pl. XLIII, *B*).

Salarias brevis Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, pp. 29, 334, pl. 16, fig. 18, 1868 (type loc., Savaii, Samoa).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 19, 1869 (Savay).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 203, pl. 118, fig. C. 1877 (Savaii).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 518, 1900 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 506, 1902 (1903) (Honolulu).

Exallias brevis Jordan and Evermann: U S. Fish Comm., Bull., vol. 23, pt. 1, p. 503, fig. 224, 1903 (1905) (Honolulu).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1412, 1906 (types).

Cirripectes brevis Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 20, 1925 (Guam).

Blennius brevipinnis Günther: Cat. fishes Brit. Mus., vol. 3, p. 226, 1861 (type loc., Hawaiian islands; west coast Central America).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 194, 1877 (Hawaiian types).

Blennius leopardus Day: Fishes of India, pt. 2, p. 325, pl. 68, fig. 6, 1876 (Hawaiian islands).

Head 3 1/8 to 3 1/3; depth 2 2/3 to 3 1/8; D. XII, 13; A. II, 14, 1; snout 2 1/8 to 2 1/5 in head; eye 4 to 5; maxillary 2 2/3 to 2 7/8; interorbital 1 3/5 in eye. Least depth of caudal peduncle 2 7/8 in head. Head width 1 2/5 in its length. No canines. Both lips fringed with rather conspicuous papillae. Supraorbital tentacle nearly long as eye, expanded with 7 terminal fleshy points. Front nostril with flap about long as pupil, ending in 5 fleshy points, not shown in Günther's figure. Transverse nuchal fringe well developed, also not indicated on Günther's figure. Soft dorsal joined behind with caudal peduncle, not with caudal fin. Last dorsal spine very inconspicuous and only about half of eye.

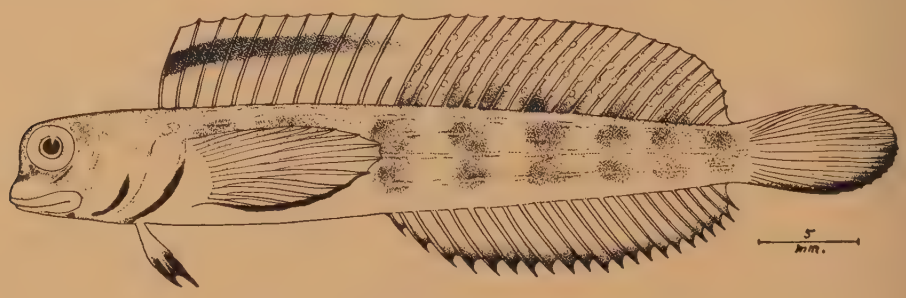

FIGURE 72.—Drawing of *Blennius rhabdotrachelus*.

Only known from the type in the Bishop Museum, 45 mm. long. It is clearly distinguished from the other species by the dark bars on the lower surface of the head. These greatly suggestive of the color-pattern of *Petroscirtes kochi* Weber, which are described differently.

Third dorsal spine 1 1/3 in head; third dorsal ray 1 1/2; fifth anal ray 2; caudal 1 1/10; pectoral 1; ventral 2.

One in the Academy from Hawaii, 112 mm. The Bishop Museum has 1 from Honolulu 138 mm. long obtained by J. W. Thompson in 1910 and 1 at Waikiki 53 mm. long through C. H.

Edmondson in 1922. The Agassiz Museum has 1 from Ascension Island in the Marshall Islands 93 mm. long, through Rev. A. A. Sturges and 1 from Kingsmills through Andrew Garrett which is 113 mm. long.

There is little doubt that Day's *Salarias leopardus* (Zool. Soc. London, Proc., p. 518, 1869, type loc., off Galle Harbor) is more characteristic of the species than the earlier *Salarias brevis* Kner. Day describes the presence of "two bifid tentacles on either side of the symphysis of the lower jaw," which are really a pair of tentacles each side of the lower jaw in my specimen, with a distinct pore at the base of each. The "two fleshy prominences anterior to the anal fin" mentioned by Day are quite conspicuous in my specimen, in fact fishy terminations of the anal spine and are with distinct supports rather than with sessile appearance as shown in Day's figure. *Exallias* Jordan and Evermann may therefore be admitted simply as of subgeneric value, chiefly characterized by the absence of canines.

Ceylon, Micronesia, Polynesia, Hawaii.

Cirripectes alboapicalis (Ogilby).

Salarias alboapicalis Ogilby: Linn. Soc. New South Wales, Proc., vol. 23, p. 742, 1898 (type loc., Lord Howe Island).

Cirripectes alboapicalis Fowler: B. P. Bishop Mus., Occ. Papers, vol. 10, no. 7, p. 389, 1923 (Honolulu).

Exallias obscurus Borodin: Am. Mus. Novitates, no. 281, p. 1, fig., Sept. 12, 1927 (type loc., Oahu).

Head 3 2/3; depth 3; D. XI, 16; A. II, 16, 1; P. 15; V. 3; snout 2 1/4 in head; eye 4 1/3; maxillary 1 7/8; mouth width 1 5/6; interorbital 6.

Body elongately ovate, deepest about middle of pectoral, strongly compressed. Caudal peduncle not free, strongly compressed, least depth 2 3/4 in head.

Head width 1 1/3 in its length, swollen below, compressed sides moderately approximate above, upper front profile more inclined and convex than lower. Snout slightly protruded beyond forehead, long as wide. Eye high, center at first third in head. Mouth large, wide, inferior, lower jaw shorter. Lips broad, fringed. Teeth fine, slender, each dental edge deeply scalloped, or 5 lobes in each jaw; pair of strong lower canines. Maxillary extends back opposite hind edge of eye; expansion 1 1/6 in eye. Front nostril with fleshy flap, edged with 8 tentacles, placed at last third in snout; hind nostril similar sized aperture, elevated and close to eye. Interorbital level, with slight concavity. Supraorbital flap of 5 slender tentacles 3/5 of eye. Fringe of tentacles of about same length entirely over occiput.

Gill opening extends forward opposite eye center. Gill rakers 5+20, slender short points, 1/4 of gill filaments, which 1 1/3 in eye. Pseudobranchiae long as gill filaments. Isthmus broad, width 2 in snout, branchiostegal membrane forming free fold across.

Skin smooth. Lateral line continuous, nearly reaches caudal base, broken moderately posteriorly; straight section 7/8 of curved portion.

Spinous dorsal begins on occiput, opposite upper hind edge of gill opening, spines rather pungent, membranes all more or less deeply incised marginally and notch deep separating rayed fin; first spine 1 1/4 in head. Soft dorsal begins between hind eye edge and caudal base, front rays highest and last one joined by membrane with upper edge of caudal peduncle, not quite reaching to origin of upper caudal lobe; first dorsal ray 1 1/2 in head. Anal inserted midway between hind eye edge and caudal base, membranes each with deep marginal notch; thirteenth ray 1 7/8 in head. Caudal with hind edge little oblique, lower rays little longer, edges of fin rounded above and below; fin long as head. Pectoral broad, lower median rays longest, reaches anal; fin long as head. Ventral jugular, inserted opposite middle in head, reaches half way to anal; fin 1 1/2 in head.

Color in alcohol deep neutral-brown generally. Ends of anterior dorsal spines ruddy. All vertical fins more or less uniform dusky-neutral tint. Belly and under surface of head little paler than upper surfaces. Teeth fine. Length 152 mm.

The Bishop Museum has a single specimen secured in the Honolulu market by J. W. Thompson, in June, 1916. It agrees with McCulloch and McNeil's figure (Australian Mus., Records, vol. 12, p. 22, pl. 4, fig. 2, 1918 [February 4]) of the specimen from Lord Howe Island, except that the upper half of the spinous dorsal, at least anteriorly, is reddish instead of whitish. The edge of the anal is also not pale, but blackish.

Cirripectes rechingeri (Steindachner).

Salarias rechingeri Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1411, 1906 (type loc., Savaii).

Head 4; depth 4 1/2; D. XIII, 19; A. 24. Snout steeply inclined. No canines. Divided tentacle above eye, nearly half eye diameter. Faint trace of fringe at occiput. Dorsals deeply notched, confluent with caudal. Anal free, lower than dorsal. Light gray-brown, with 6 bluish-violet crossbands, across each 2 or 3 pale lines; between each 2 crossbands little paler, short violet cross streak reaching down to middle of back. Under lens innumerable gray-violet dots over all body. Head clear gray-violet, with silver-gray twisted lines on cheek. Dorsal gray-violet with 2 or 3 pale longitudinal streaks, somewhat oblique. Anal and posterior edge of dorsal pale. Length 35 mm. (Steindachner)

The rudimentary occipital fringe suggests this may belong in *Cirripectes*.

Cirripectes sebae (Valenciennes).

Salarias sebae Valenciennes: Hist. nat. Poiss., vol. 11, p. 239, 1836 (type loc., East Indies) (on Seba, Thesas., vol. 3, p. 30, no. 5, 1734-65).—Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, p. 333, 1868 (Viti Islands).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 19, 1869 (Viti Islands).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 202, 1877 (Samoa; Fiji; Society Islands).

Head 4 1/3; D. XI or XII, 15 or 16; A. 15 or 16. Short fringed tentacle above eye and row of cirrhi each side of neck. Lower canines present. First or first 3 dorsal spines elongate. Dorsals only slightly notched, extend on caudal. Black or bluish-gray, marbled darker, some as blotches, others as bands. Dorsals and caudal dark, red above. (Günther)

The type was stated to be 51 mm. long.

East Indies, Polynesia.

Cirripectes variolosus (Valenciennes).

Salarias variolosus Valenciennes: Hist. nat. Poiss., vol. 11, p. 235, 1836 (type loc., Guam).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 29, 1875 (Savaii; Tonga).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 203, pl. 116, fig. A, 1877 (Samoa; Tonga; Society Islands; Tahiti).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 518, 1900 (Hawaiian islands).—Jenkins: U. S. Fish

Comm., Bull., vol. 22, p. 507, 1902 (1904) (Honolulu).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 125, 1922 (Pago Pago).

Alticus variolosus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 497, 1903 (1905) (Honolulu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 424, 1905 (1906) (Apia).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 155, 1912 (La Perouse Bay, Easter Island).

Cirripectes variolosus McCulloch and McNeil: Australian Mus., Records, vol. 12, p. 22, 1918 (February 4) (New Hebrides).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 38, p. 29, 1927 (Fanning and Christmas islands).

Rupiscartes variolosus Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 29 (Johnston and Wake islands).

Salarias nigripes Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 127, 1900 (type loc., Guam).

Salarias nitidus (non Günther) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 127, 1900 (Guam; part).

Head 3 2/5 to 3 1/2; depth 3 1/5 to 3 2/5; D. XI or XII, 15; A. I or II, 16, 1; snout 2 3/5 to 3 in head; eye 3 4/5 to 4 1/4; maxillary 2 1/8 to 2 1/3; interorbital 2 to 3 1/4 in eye. Both lips fringed with row of fine papillae, sometimes less evident in large specimens. Orbital tentacle ends in 5 filaments, 3/4 of eye. Nuchal fringe present. Front nostril with fringed tentacle nearly long as supraorbital. First dorsal spine about half an eye-diameter longer than head. Anal spines with fleshy ends. In alcohol mostly dull uniform brown, with small scattered whitish spots on trunk. Length 72 to 95 mm.

The Academy has 1 from Thomas Nuttall and 1 from W. H. Jones, both Hawaiian, and 1 from Pago Pago. In the Bishop Museum 30 specimens, including the type of *Salarias nigripes* from Agaña on Guam, and 2 others as *Salarias nitidus*. Also 2 from Honomuni on Molokai in July, 1914, through W. A. Bryan, 1 from Waikiki in 1922 through C. H. Edmondson, and 1 from Palmyra Island in 1922 through Thurston and Thaanum. Also 22 from Johnston Island and 65 from Wake Island in 1923. The National Museum has 5 from Apia and 4 from Easter Island. In the Agassiz Museum 1 from Easter Island.

McCulloch and McNeil have noticed the very closely allied *Salarias alboapicalis* Ogilby (Australian Mus., Records, vol. 12, no. 2, p. 22, pl. 4, fig. 4, 1918) as differing in the eleventh dorsal spine shorter than the postorbital portion of the head and the membrane of the last dorsal ray not reaching the caudal rays. In my smallest specimen the eleventh dorsal spine is variably less than the postorbital. Both have the last dorsal ray joined by a broad membrane with the caudal. I notice, however, that the dorsal spines are sometimes abnormal and in one case a median spine is even shorter than the last. The same is also true of specimens of *Alticus*. Jouan mentions as *Blennius* No. 20 a small fish very common about the marshes and brackish waters of New Caledonia, suggestive of a skink (Soc. Cherbourg, Mem., vol. 8, p. 253, 1861). It is said to have two dorsals, the first very elevated. *Cirripectes filamentosus* Alleyne and Macleay as described and figured by McCulloch and McNeil (Australian Mus., Records, vol. 12, no. 2, p. 21, fig. 1, 1918) with the front dorsal spine elongated, is hardly distinct.

Micronesia, Polynesia, Hawaii, Easter Island.

Salarias saliens (Forster).

Blennius saliens Forster: Itin., vol. 2, p. 343, 1788 (type loc., Tanna Islands).—Lacépède: Hist. nat. Poiss., vol. 2, p. 478, 1800 (New Britain).

Alticus saliens Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 88, 1906 (Nukuhiva).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 421, fig. 111, (on p. 439) 1905 (1906) (Apia; Pago Pago).

Salarias saliens Fowler and Bean: U. S. Nat. Mus., Proc., vol. 71, p. 15, 1927 (Tahiti).—Fowler: B. P. Bishop Mus., Bull. 38, p. 29, 1927 (Latei, Tonga Island).

Blennius amphibius Walbaum: Artedi, Piscium, pt. 3, p. 187, 1792 (on Forster).—Donndorf: Zool. Beyträge, vol. 3, p. 314, 1798.

Alticus saltatorius (Commerson) Lacépède: Hist. nat. Poiss., vol. 2, p. 479, 1800 (type loc., New Britain).

Blennius tridactylus (non Lacépède 1800) Schneider: Systema ichth., Bloch, p. 176, 1801 (type loc., Tanna Island).

Salarias tridactylus Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 200, pl. 117, figs. C-D, 1877 (Vavaii; Society Islands).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma).

Salarias alticus Valenciennes: Hist. nat. Poiss., vol. 11, p. 249, 1836 (type loc., New Ireland; Java; Ganges River mouth; Trinquemale; Red Sea).

Blennius gobioides Lichtenstein: Descriptiones animalium, p. 283, 1844 (type loc., Tanna Island).

Salarias sertatus Garman: Mus. Comp. Zool., Bull., vol. 39, p. 237, pl. 4, fig. 2, 1903 (type loc., Solo Island, North Astrolabe Reef, Fiji).

Head 6 1/2; depth 8; D. XIII or XIV, 23; A. 26. Front profile vertical. Male with short trifid tentacle above eye and median crest on cranium, both absent in female. No nuchal filament. Canine each side of lower jaw. Dorsals with slight median notch, membrane behind not reaching caudal; both fins higher than anal. Clear slate with irregular and diffuse crossbands. Dorsals uniform, with clear edge. Anal pale, or with row of darker spots. Length 76 mm. (Günther)

In the Bishop Museum 12 from Nukuhiva, 43 to 87 mm. The National Museum has 4 from Samoa.

The types of *Salarias sertatus* in the Agassiz Museum, 2 specimens, are this species.

Evidently described as *Blennius* by Jouan (Soc. Cherbourg, Mem., vol. 9, p. 107, 1863) from Port de France, New Caledonia, from a specimen 100 mm. long.

Red Sea, Bourbon, India, Ceylon, East Indies, Melanesia, Polynesia.

Salarias nitidus Günther.

Salarias nitidus Günther: Cat. fishes Brit. Mus., vol. 3, p. 243, 1861 (type loc., China).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 200, pl. 113, figs. F-G, 1877 (Samoa; Bonham Island).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 15, 1877 (Pelew Islands).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 127, 1900 (Guam; as a new species).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1410, 1906 (Samoa).

Alticus evermanni Jordan and Seale: (U. S.) Bur.

Fish., Bull., vol. 25, p. 422, 1905 (1906) (type loc., Apia).

Head 4 1/2 to 5 1/8; depth 5 1/8 to 5 1/2; D. XIII, 21 or 22; A. I, 23; snout 3 1/2 in head; eye 3 1/2; maxillary 2 1/3. Front profile of snout vertical or inclined before mouth. Small supraocular tentacle, none on neck. Lower canines present. Dorsals divided by deep notch, continuous in young; connected behind by membrane with caudal; not higher than body. Body with 8 brown crossbands, extend on dorsal bases. Head and body with pearl-brown spots, small and round on head, elongate and horizontal on body. Upper half of soft dorsal with 2 rows of white spots. Caudal with 4 transverse rows of white spots. Anal uniform or with row of white basal spots. (Günther)

Four in the Bishop Museum from Guam, 70 to 91 mm. The species reaches 127 mm.

McCulloch separates the Queensland form as *Salarias belemnites* De Vis (Linn. Soc. New South Wales, Proc., vol. 9, p. 695, 1884, type loc., Queensland coast) and identifies it with *Alticus evermanni,* including Samoa and New Hebrides materials (Australian Mus., Records, vol. 15, no. 1, p. 389, 1926).

China, Micronesia, Polynesia.

Salarias fasciatus (Bloch).

Blennius fasciatus Bloch: Nat. ausländischen Fische, pt. 2, p. 110, pl. 162, fig. 1, 1786 (type loc., East Indies).

Salarias fasciatus Schmeltz: Mus. Godeffroy, Cat. 4, p. 19, 1869 (South Sea).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 201, pl. 115, fig. H, 1877 (Fiji; New Hebrides; Samoa; Tonga; Ponapé).—Garman: Mus. Comp. Zool., Bull., vol. 39, p. 238, August, 1903 (Suva, Fiji).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 427, 1905 (1906) (Apia; Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 22, p. 36. 1925 (Samoa).

Rupiscartes fasciatus Fowler: B. P. Bishop Mus., Bull. 22, p. 19, 1925 (Guam).

Salarias quadripinnis Valenciennes: Hist. nat. Poiss., vol. 11, p. 235, 1836 (type loc., Timor; Tongatabu; Vanicoro).

Salarias histronicus (Kuhl and Van Hasselt) Valenciennes: Hist. nat. Poiss., vol. 11, p. 237, 1836 (name in text) (type loc., Java).

Salarias rotondifrons Thiollière: Fauna Woodlark, p. 185, 1857 (type loc., Woodlark Island).

Blennius kuasut (Montrouzier) Thiollière: Fauna Woodlark, p. 185, 1857 (name in synonymy).

Salarias semilineatus Kner: Akad. Wiss. Wien, Sitz., vol. 56, p. 722, pl. 4, fig. 3, 1867 (type loc., Samoan Islands).—Kner: op. cit., vol. 57, pt. 1, p. 322, 1868 (Kandavu, Fiji).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 29, 1874 (Samoa).

Petroscirtes semilineatus Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 197, 1877 (copied).

Head 3 3/4 to 4 1/8; depth 3 1/10 to 3 2/3; D. XII, 19; A. 1, 19 or 1 or 11, 20; snout 2 2/3 to 3 1/8 in head; eye 3 to 3 3/4; maxillary 2 1/5 to 2 1/3; interorbital 2 to 2 7/8 in eye. Supraorbital tentacle 1 1/4 in eye, bifid, front branch with 2 or 3 filaments; small example with shorter tentacle and fewer filaments; occipital flap with 6 to 8 filaments; nasal filament equals pupil diameter, ends with 3 filaments; no canines; lips entire.

In the Academy 9 from Pago Pago 52 to 97 mm. The National Museum has 2 from Fiji obtained by the Wilkes Expedition. Also a series from Samoa through the Bureau of Fisheries. The Agassiz Museum has 9 from Pago Pago, 1 from near Suva, 3 from Ponapé, Caroline Islands, through Rev. L. H. Gulick.

Likely *Salarias cephalotes* Thiollière (Fauna Woodlark, p. 186, 1857, type loc., Woodlark Island) as first noted may refer to this species. It is said to be without tentacles or crest on the head. Dorsals entire, X, 17. Anal 17. Black, with paler vertical undulations. Possibly the crested *Salarias cephalotes* Thiollière, referred to later, is *Salarias spaldingi* Macleay. Its anterior anal rays are said to be deeply notched on membranes terminally.

Jouan has mentioned this species as *le Blennie* (Soc. Cherbourg, Mem., vol. 21, p. 332, 1877-78) from New Caledonia. His earlier reference to *Blennius* No. 21 (Soc. Cherbourg, Mem., vol. 8, p. 253, 1861) may also be intended for this species.

Red Sea, Johanna Island, Bourbon, India, East Indies, Melanesia, Micronesia, Polynesia.

Salarias fuscus Rüppell.

Salarias fuscus Rüppell: Neue Wirbelth., Fische, p. 135, pl. 32, fig. 2, 1835 (type loc., Massaua, Red Sea).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11. p. 202, pl. 116, fig. C, 1877 (Pelew Islands; Vavau).—McCulloch and McNeil: Australian Mus., Records, vol. 13, p. 12, 1918 (Friendly Islands; New Hebrides).

Salarias holomelas Schmeltz: Mus. Godeffroy, Cat. 6, p. 15, 1877 (Pelew Islands).

Resembles *Salarias fasciatus* in the dorsal entire or scarcely notched between spines and rays and the absence of the occipital crest. It differs in the absence of nuchal tentacles and its nearly uniform black coloration. Reaches 75 mm.

Two in the National Museum from Fiji, obtained by the Wilkes Expedition.

Jouan describes *Blennius* No. 19 from Baie du Sud, New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 253, 1861) evidently this species: D. 31; A. 21. Body elongate, compressed. Head moderately compressed. Mouth small, upper jaw longer. Lateral line straight. Dorsals continuous, well separated from caudal. Anal separate from caudal, which rounded. No barbels, crests or filaments. Bottle green. Length 50 mm.

Red Sea, India, East Indies, Queensland, Melanesia, Micronesia, Polynesia.

Salarias marmoratus (Bennett).

Blennius marmoratus Bennett: Zool. Jour., vol 4, p. 35, 1828 (type loc., Hawaiian islands).

Salarias marmoratus Günther: Cat. fishes Brit. Mus., vol. 3, p. 562, 1861 (type).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 19, 1869 (Samoa).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 204, pl. 116, fig. B, 1877 (Hawaiian islands; Aneiteum; Tahiti; Bonham Islands; Society Islands).—Waite: Australian Mus., Mem., no. 3, p. 190, 1897 (Funafuti, Ellice Islands).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 507, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 536, 1902 (1904) (Laysan Island).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1,

p. 87, 1906 (Nukuhiva).—Fowler and Bean: U. S. Nat. Mus., Proc., vol. 71, p. 15, 1927 (Tahiti).—Fowler: B. P. Bishop Mus., Bull. 38, p. 29, 1927 (Necker, Laysan, Fanning and Tongareva islands).

Alticus marmoratus Jordan and Evermann: U. S. Fish Comm., Bull., no. 23, pt. 1, p. 498, fig. 220, 1903 (1905) (Kailua; Hilo; Waianae; Honolulu).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).

Rupiscartes marmoratus Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 83, Dec., 1922 (Hawaii).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 20, 1925 (Necker, Laysan and Wake islands).

[*Salarias striatus* (Quoy and Gaimard) Valenciennes: Hist. nat. Poiss., vol. 11, p. 228, 1835 (type loc., Mauritius).]

Alticus striatus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 423, 1905 (1906) (Aua in Tutuila, Samoa).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 154, 1912 (Easter Island; Samoa).

Rupiscartes striatus Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 28, 1925 (Gardner Island).

Alticus thalassinus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 425, fig. 103, 1905 (1906) (type loc., Apia).

Alticus musilae Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 425, fig. 104, 1905 (1906) (type loc., Apia).

Salarias arenatus Regan: Zool. Soc. London, Proc., p. 372, 1913 (Easter Island).—Fuentes: Mus. Nac. Chile, Bolet., vol. 7, no. 1, p. 380, pl. 8, fig. 2, 1914 (Vaihou, Easter Island).

Head 3 3/4 to 4; depth 4 to 5 1/2; D. XII, 15 or 16; A. I or II, 16 or 17; snout 2 1/2 to 2 2/3 in head; eye 4 1/3 to 5 1/4; maxillary 2 to 2 1/4; interorbital 1 2/5 to 2 in eye.

Body elongate, well compressed. Caudal peduncle well compressed, least depth 2 3/4 to 3 in head. Head width 1 1/4 to 1 1/3 in its length. Snout broadly obtuse, steep. Eye high, slightly impinging on upper profile; diameter 1 7/8 to 2 in snout; supraorbital flap 2/3 to 1 in eye. Mouth large, inferior, width 1 2/3 to 1 3/4 in head. Lips broad, fleshy, edge of upper row of rather coarse scalloped papillae. In profile maxillary extends back opposite hind eye edge. Teeth fine, flexible, implanted in even row in each jaw; small or moderate curved upper and lower canine each side. Front nostril at last fourth in snout length, with short flap; hind nostril simple pore, little closer to eye than to front nostril. Interorbital narrowly concave. Gill opening extends forward for last third of head, membrane forming broad free fold across isthmus. Gill rakers 2 + 14, short points, 1/4 of gill filaments, which 1 1/4 in eye.

Skin smooth. Lateral line high at first, curves down medianly little before pectoral end and then extends midway to caudal base. Short nuchal filament each side of occiput. First dorsal spine 2 1/3 to 3 in head; dorsals deeply notched or nearly separate; first dorsal ray 1 1/2 to 1 3/5; first anal ray 3 to 3 1/2; pectoral 1; ventral 1 2/3 to 1 3/4; caudal obliquely truncate, with lower median rays little longer (1 1/5 in head) and edges rounded.

Pale brownish generally. Back and upper surfaces little more brownish, under surface of head and belly pale. Side with 14 deep brown vertical bands, each reflected as spot along dorsal bases. Oblique blackish postocular bar long as eye. Iris pale brownish. Dorsals pale, with 2 irregular series of rather large dusky blotches on spinous fin and 3 or 4 irregular series of small dusky spots on soft fins. Anal pale, terminally with obscure brown blotches, more as spots on posterior rays. Caudal pale, with 7 dusky waved cross-lines. Paired fins plain brownish. Length 25 to 65 mm.

In the Agassiz Museum 2 from Easter Island, obtained December 20, 1904. The National Museum has 1 from Samoa and 4 from Easter Island. Ten specimens without locality, likely Hawaiian?, obtained by the Wilkes Expedition. One from Honolulu through W. H. Pease, 1 from O. P. Jenkins, series from Laysan and 6 from Kailua. The Bishop Museum has 9 from Honolulu and 5 from Nukuhiva, largest 109 mm. Also 1 from Gardner Island, 2 from Necker Island, 1 Laysan, and 1 Wake Island in 1923. In the Academy 2 Hawaiian specimens, obtained by W. H. Jones, 75 to 105 mm.

Both *A. thalassinus* Jordan and Seale and *A. musilae* Jordan and Seale seem to be synonyms; *A. musilae*, the young.

Mauritius, Ceylon, Melanesia, Polynesia, Hawaii, Easter Island.

Salarias guttatus Valenciennes.

Salarias guttatus Valenciennes: Hist. nat. Poiss., vol. 11, p. 228, 1835 (type loc., Vanicolo).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 29. 1874 (Rarotonga).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 204, 1877 (compiled).

Alticus guttatus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 424, 1905 (1906) (Apia).

Salarias griseus De Vis: Linn. Soc. New South Wales, Proc., vol. 8, p. 450, 1880 (type loc., South Sea Islands).

Depth 6 in total; D. XII, 17 or 18; A. 20. Front profile of snout nearly vertical. Small simple tentacle above eye and smaller one each side of neck. Canines in lower jaw. Dorsals notched half height, ends close before caudal. Brownish-gray, with brown spots on back and white ones on belly. Pectoral base with 3 large round blotches. Fin rays dotted brown. Length 51 mm. (Günther)

One in the National Museum from Apia.

Salarias griseus is apparently the same, though its dorsal is said to be continuous with the caudal.

Salarias aneitensis Günther.

Salarias aneitensis Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 205, pl. 118, fig. A, 1877 (type loc., Aneiteum).

Head 6; depth 5 1/2; D. XIII, 17; A. 18; snout 2 1/2 in head; eye 4 1/3, 1 3/4 in snout; maxillary 3 1/8 in head. Front profile of snout nearly vertical. No supraocular tentacle? Canine teeth in lower jaw. No nuchal filaments or crest. Dorsals low, deeply notched, last ray joined by low membrane with caudal. Brown, with many dark dots, forming longitudinal lines on tail. Dorsal with oblique short blackish streaks. Anal with dark longitudinal bands. Caudal with dark spots. Length 178 mm. (Günther)

Salarias alboguttatus Kner.

Salarias alboguttatus Kner: Akad. Wiss. Wien, Sitz., vol. 56, p. 724, pl. 4, fig. 4, 1867 (type loc., Samoan Islands).—Kner: op. cit., vol. 57, pt. 1, p. 334, 1868 (Kandavu, Fiji).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 205, pl. 118, fig. B, 1877 (Samoa; Kandavu).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1410, 1906 (Upolu; Samoa).

Alticus alboguttatus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 424, 1905 (1906) (Apia; Pago Pago).

Entomacrodus sealei Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 138, 1902 (1903) (type loc., Marcus Island).

In the Bishop Museum the type of *Entomacrodus scalci*. It shows 18 anal rays, though Bryan and Herre give but 17. The dorsal fin terminates freely before the caudal, leaving a free caudal peduncle. No white spots now at base of caudal. In the National Museum 1 from Samoa.

I have seen a drawing of a specimen from Fiji, 53 mm. long, obtained by the Wilkes Expedition. It differs a little from Günther's figure in showing a small eye, no supraorbital tentacle and uniform dull anal.

Salarias gibbifrons Quoy and Gaimard.

Salarias gibbifrons Quoy and Gaimard: Voyage "Uranie," Zool., p. 253, 1824 (type loc., Hawaiian islands).

In the Academy 1 Hawaiian specimen through J. K. Townsend and 1 from Pago Pago. The Bishop Museum has a specimen from Marcus Island. One from Johnston Island and 3 from Wake Island in 1923. In the National Museum the type of *Salarias saltans,* type of *Salarias rutilus,* 1 from Honolulu through W. H. Jones in March of 1883, and 141 Hawaiian specimens through the Bureau of Fisheries.

Salarias quagga (Fowler and Ball) (fig. 73).

Rupiscartes quagga Fowler and Ball: Acad. Nat. Sci. Philadelphia, Proc., p. 273, 1924 (type loc., Wake Island).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 29, 1925 (types).

FIGURE 73.—Drawing of *Salarias quagga.*

—Valenciennes: Hist. nat. Poiss., vol. 11, p. 231, 1836 (Hawaii).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 205, pl. 116, fig. C, 1877 (Rarotonga; Hawaii).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 517, 1900 (Hawaiian islands).—Snyder: U. S. Fish Comm., Bull., vol. 22, p. 536, 1902 (1904) (Honolulu; Hilo).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 125, 1922 (Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 38, p. 30, 1927 (Fanning and Tongareva islands).

Entomacrodus gibbifrons Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 138, 1902 (1903) (Marcus Island).

Alticus gibbifrons Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1. p. 499, figs. 221-a, 1903 (1905) (Hilo; Waikiki; Kailua; Honolulu).—Fowler: Copeia, no. 112, p. 85, Nov. 20, 1922 (Hawaii).

Rupiscartes gibbifrons Fowler: B. P. Bishop Mus., Bull. 22, p. 30, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 29, 1925 (Johnston and Wake islands).

Salarias saltans Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 508, fig. 48 (♂), 1902 (1904) (type loc., Honolulu).

Salarias rutilus Jenkins: U. S. Fish Comm., Bull. vol. 22, p. 509, fig. 49 (♀), 1902 (1904) type loc., Honolulu).

Head 3 3/4 to 4 1/2; depth 4 3/5 to 4 7/8; D. XIII, 17 to 20; A. I or II, 19 or 20; snout 2 2/5 to 3 in head; eye 3 to 4; maxillary 2 1/3 to 2 7/8; interorbital 2 in eye. Supraocular tentacle simple, slender, less than eye. Lips entire. Pair of lower canines present. Dorsals, anal and caudal all spotted or dotted with deep brown. Length 34 to 97 mm.

Type and 30 paratypes in the Bishop Museum, obtained at Wake Island in 1923. Known by its partially striped or barred color-pattern.

Salarias coronatus Günther.

Salarias coronatus Günther: Cruise of "Curaçoa" (Brenchley), p. (410) 424, pl. 33, fig. B, 1873 (type loc., Solomon Islands).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 206, pl. 116, fig. E, 1877 (Solomons).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 86, 1906 (Nukuhiva).

Alticus coronatus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 424, 1905 (1906) (Apia).

Head 4 3/5; depth 5 1/2; D. XIII, 20; A. 21; snout 3 1/3 in head measured from its own tip; eye 3; maxillary 2 1/8; interorbital 2 in eye. Least depth of caudal peduncle 2 1/6 in head. Head width 1 3/5 in its length. Pair of lower canines. Supraorbital tentacles 2/3 of eye. Nuchal tentacle half of pupil. Second dorsal spine 2 in head; third dorsal ray 1 1/2; third anal ray 2 1/8; caudal 1 1/10; pectoral 1 1/6; ventral 1 2/5. Length 45 to 70 mm.

In the Bishop Museum 2 from Nukuhiva. The National Museum has 4 from Apia.

Salarias edentulus (Schneider).

Blennius edentulus Schneider: Systema ichth., Bloch, p. 172, 1801 (type loc., Huahine Island, Society Group).

Salarias edentulus Schmeltz: Mus. Godeffroy, Cat. 4, p. 19, 1869 (Viti Islands).—Schmeltz: op. cit., Cat. 5, p. 29, 1874 (Samoa; Viti; Tonga).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 206, pl. 117, fig. A,

1877 (Huahine; Society Islands; Samoa; Paumotus; Bonham Islands; Rarotonga; Kandavu).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 370, 1897 (Rotuma).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 517, 1900 (Hawaiian islands).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 499, 1901 (Laysan Island).—Seale: B. P. Mus., Occ. Papers, vol. 4, no. 1, p. 86, 1906 (Faté; Makatea; Nukuhiva).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 429, 1905 (1906) (Apia; Pago Pago).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 327, 1911 (Makemo, Fakarava and Rangiroa, Paumotus).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 158, 1912 (Mangareva).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 20, 36, 38, 1925 (Guam, Samoa, Tahiti).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 29, 1925 (Wake Island).—Fowler and Bean: U. S. Nat. Mus., Proc., vol. 71, p. 15, 1927 (Tahiti).—Fowler: B. P. Bishop Mus., Bull. 38, p. 30, 1927 (Howland, Fanning, Christmas, Tongareva and Baker islands).

Blennius truncatus (Forster) Schneider: Syst. ichth., Bloch, p. 172, 1801 (name in synonymy) (type loc., Huaheine).—Lichtenstein: Descriptiones animalium, p. 231, 1844.

Salarias forsteri Valenciennes: Hist. nat. Poiss., vol. 11, p. 233, 1836 (on *Blennius truncatus* Forster).

Salaris rivulatus Rüppell: Atlas Reis. Nordl. Afrika, Fische, p. 114, 1828 (type loc., Tor, Red Sea).

Salarias rivulatus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 429, 1905 (1906) (Pago Pago; Apia).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 149, 1913 (Saonek, Waigiu).—McCulloch and McNeil: Australian Mus., Records, vol. 13, p. 15, pl. 3, figs. 3-4, 1919 (New Hebrides; Samoa; Funitui).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 126, 1922 (Pago Pago).

Salarias melanocephalus [Bleeker: Bataviaasch Genoots., Verh., no. 3, vol. 22, p. 18, 1849 (type loc., Pagotang, South Java).] Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 5, 1859 (Doreh, New Guinea).

Salarias lividus Thiollière: Fauna Woodlark, p. 185, 1857 (type loc., Woodlark Island).

Blennius kuasut (Montrouzier) Thiollière: Fauna Woodlark, p. 185, 1857 (name in synonymy).

Salarias quadricornis Kittlitz: Denkw. Reis Mikronesien, vol. 2, p. 188, 1858 (Bonin Islands).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 19, 1869 (Mac Kean Island).—Schmeltz: op. cit., Cat. 5, p. 29, 1874 (Samoa; Phoenix Islands).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 209, pl. 117, fig. B, 1877 (Society Islands; Paumotus; Upolu).—Streets: U. S. Nat. Mus., Bull., no. 7, p. 80, 1877 (Fanning Islands).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma).—Waite: Australian Mus., Mem., no. 3, p. 191, 1897 (Funafuti, Ellice Islands).—Pellegrin: Mus. Hist. Nat. Paris, Bull., vol. 4, p. 229, 1898 (Guam).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1411, 1906 (Savaii).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 86, 1906 (Mangareva; Rarotonga; Nukuhiva; Makatea).

Salarias gilberti Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 135, 1902 (1903) (type loc., Marcus Island).

Salarias marcusi Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, p. 137, 1902 (1903) (type loc., Marcus Island).

Salarias azureus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 87, fig. 8 (no. 783) 1906 (type loc., Tubuai, Austral Islands).

Salarias bryani Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 430, fig. 108, 1905 (1906) (type loc., Apia).

Head 3 2/3 to 4 2/5; depth 3 4/5 to 4 4/5; D. XIII or XIV, 18 to 22; A. I or II, 20, I to 24, I; snout 2 3/5 to 5 1/5 in head; eye 2 7/8 to 4 1/2; maxillary 2 1/8 to 2 1/2; interorbital 1 1/3 to 2 2/5 in eye. No canines; lips entire; supraocular filament 3/4 of eye, simple; front nostril with quadrifid tentacle 1/3 to 1/2 of eye; male with well-developed median cutaneous occipital keel; pair of nuchal filaments, little shorter than supraoccipital; maxillary extends well beyond vertical of eye. Last dorsal ray rather broadly joined with caudal; front 3 to 7 anal rays terminally with adipose swellings, papillate, dark.

Dull brown. Spinous dorsal with 4 to 6 longitudinal rows of white to brown spots, in male as whitish lines, 2 on spinous dorsal, 10 on soft dorsal and 2 to 4 on anal, though on soft dorsal inclined. Body and tail with 7 or 8 transverse brownish bands, finely dotted brown posteriorly. Oblique brown bar behind eye. Caudal nearly uniform, or only few pale brown bars basally. Pectoral finely spotted.

The Academy has 4 from Tahiti through Andrew Garrett, 1 Hawaiian through W. H. Jones, 19 Apia and 9 Pago Pago. Largest 108 mm. In the National Museum 3 from Fiji obtained by the Wilkes Expedition, 69 to 118 mm. Also a drawing of a specimen from Tongatabu 53 mm. Others are 2 from the Bonin Islands through William Stimpson, 2 from the Fanning Islands through T. H. Streets, 30 Mangareva, series from Apia, 3 Makemo, 1 Fakarava, 1 Makatea, 1 Rangiroa. In the Bishop Museum 3 types of *Salarias gilberti*, 2 types of *Salarias marcusi*, 2 types of *Salarias azureus*, 2 Marcus Island, 1 Mangareva and 56 Nukuhiva. Largest 126 mm. Also 4 from Wake Island in 1923. In the Agassiz Museum 5 Hawaiian specimens obtained by Andrew Garrett, 1 Maui through C. F. Winslow, 18 Apia, 1 Tonga, 4 Makatea, 9 Mangareva, 1 Rangiroa, 37 Society Islands.

Salarias bryani is based on a specimen but 35 mm. long and is likely the young. It in no way differs from similar young specimens examined.

Jouan describes a specimen 90 mm. long as *Blennius* from Baie du Sud, New Caledonia (Soc. Cherbourg, Mem., vol. 9, p. 106, 1863).

Red Sea, Madagascar, Bourbon, Mauritius, Seychelles, India, East Indies, China, Queensland, Melanesia, Polynesia, Hawaii.

Salarias amboinensis Bleeker.

Salarias amboinensis Bleeker: Soc. Sci. Ind. Neerl., Act. (Amboina), vol. 2, p. 67, 1857 (type loc.; Amboina). Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 148, 1913 (Saonek, Waigiu).

Head 6 2/3 in total; depth 7 2/5; D. XIII, 19; A. 20. No crest on head or tentacles on neck; short fringed tentacle above orbit, simple one at nostril. No canines. Dorsal slightly emarginate, not reaching caudal. Violet, marbled brownish and greenish. Fins yellow. Front part of dorsal marbled with violet and blue spot between first and second spines; hind part with 3 violet spots at base; each ray with brown spot. (Günther).

East Indies.

Salarias irroratus Alleyne and Macleay.

Salarias irroratus Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 337, pl. 13, fig. 4, 1877 (type loc., Low Island, Australia).—McCulloch

and McNeil: Australian Mus., Records, vol. 13, p. 13, pl. 3, fig., 1918 (New Hebrides).

Salarias atkinsoni Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 428, fig. 106, 1905 (1906) (type loc., Pago Pago).

Resembles *Salarias edentulus* in the dorsal deeply notched between the spines and rays. It differs according to McCulloch and McNeil in the large mandibular canines, second dorsal 17 (compared with 18 to 22).

Salarias atkinsoni based on a specimen 24 mm. is likely the young.

North Australia, Melanesia, Polynesia.

Salarias zebra Valliant and Sauvage (Pl. XLIII, *C*).

Salarias zebra Vaillant and Sauvage: Rev. Mag. Zool., 3rd ser., vol. 3, p. 281, 1875 (type loc., Hawaiian islands).—Snyder: U. S. Fish Comm., Bull., vol. 22, p. 536, 1902 (1904) (Honolulu; Hilo; Puako Bay; Hanalei Bay; Lanai; Laysan Island; between Maui and Lanai).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 501, fig. 223-a, 1903 (1905) (Waianae; Kailua; Hilo; Moanalua; Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 83, 1922 (Hawaii).—Fowler and Ball: B. P. Bishop Mus., Bull. 26. p. 29, 1925 (Nihoa, Necker, Laysan, Lisiansky islands).—Fowler: op. cit., Bull. 38, p. 30, 1927 (Lisiansky and Necker islands).

Salarias cypho Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 506, fig. 47, 1902 (1903) (type loc., Honolulu).

The National Museum has 3 from Maui obtained by the Wilkes Expedition. Also type of *Salarias cypho,* 100 Hawaiian specimens and a series from Laysan. In the Bishop Museum 1 from the west coast of Oahu, 1 Honolulu, 2 from Waikiki in 1912 to 1916 through W. A. Bryan, 15 from Mokuauia Island in November, 1922, through C. Montague Cooke, Jr., and C. M. Cooke III, and 1 from Laysan through W. A. Bryan in 1903. Also 2 from Nihoa, 29 Laysan, 4 Necker, and 1 Lisiansky in 1923.

Salarias periophthalmus Valenciennes.

Salarias periophthalmus Valenciennes: Hist. nat. Poiss., vol. 11, p. 230, pl. 328, 1836 (type loc., Ticopia, Santa Cruz Archipelago).—Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, p. 333, 1868 (Kanathia, Viti Islands: Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 19, 1869 (Savay).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 207, pl. 114, figs. D-E, 1877 (Santa Cruz; Samoa; Rarotonga; Futuna; Society Islands; Savaii).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 126, 1900 (Guam).—Fowler: B. P. Bishop Mus., Bull. 22, p. 36, 1925 (Guam).—Fowler and Bean: U. S. Nat. Mus., Proc., vol. 71, p. 15 (Tahiti).—Fowler: B. P. Bishop Mus., Bull. 38, p. 30, 1927 (Fanning, Christmas, and Howland islands).

Salarias periopthalmus Waite: Australian Mus., Mem., no. 3, p. 545, 1899 (Funafuti, Ellice Islands).—Waite: Australian Mus., Records, vol. 5, p. 3, 1903 (Nauru, Pleasant Island, Marshalls).

Alticus periophthalmus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 422, 1905 (1906) (Apia; Pago Pago).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 325, 1911 (Makemo, Paumotus).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 155, 1912 (Mangareva, Gambier Island).

Salarias paulus Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 136, 1902 (1903) (type loc., Marcus Island).

Head 4 2/5 to 4 3/4; depth 5 1/5 to 5 2/5; D. XIII, 19 to 24; A. I or II, 20 to 23; snout 2 7/8 to 3 1/2 in head; eye 3 1/5 to 4 1/6; maxillary 2 2/5 to 2 3/4; interorbital 2 1/2 to 3 1/2 in eye.

Body elongate, well compressed. Caudal peduncle well compressed, least depth 2 in head. Head width 2 in its length. Snout broadly obtuse, little receding inward from interorbital; diameter slightly more than snout; simple or bifid supraorbital flap 2/3 to 4/5 of eye. Mouth large, inferior, width 2 1/2 in head. Lips broad, thin, edges entire. In profile maxillary extends back little beyond eye. Teeth fine, flexible, implanted in even row in each jaw; moderate curved canine each side below, none above. Front nostril about half an eye diameter before front eye edge, with short filament half eye diameter; hind nostril simple small pore, close above. Interorbital narrowly concave. Gill opening forward midway in head, membrane forming free fold across isthmus. Gill rakers 2 + 3 short knobs, 1/4 of gill filaments, which 2 in eye.

Skin smooth. Lateral line high along back until beyond pectoral, then drops medianly and inconspicuously to caudal base. Dorsals deeply notched or largely separate; first dorsal spine 2 1/4 in head; tenth dorsal ray 1 1/10; first anal ray 2 1/5; pectoral 1 1/5; ventral 1 3/4; caudal 4 in combined head and trunk, hind edge slightly oblique, with lower rays longest.

Trunk and tail with 2 longitudinal well-spaced rows of grayish-white short bars. Dorsals deep bistre basally, white marginally, and white much broader marginally or half of outer extent on second dorsal. Anal bistre, becoming blackish marginally. Caudal whitish over upper half, lower half and base brown to dusky or black. Traces of 7 deeper cross-bands on trunk and tail. Paired fins brownish. Length 112 mm.

In the Agassiz Museum 1 from Baker's Island, South Pacific, obtained by Captain Joseph Hammond in 1864. Also 2 Hawaiian specimens through Andrew Garrett, 2 from the Society Islands also through Andrew Garrett, 5 from Apia, and 1 from Mangareva. Largest 152 mm. In the Academy 1 from Thornton Island, 7 from Apia and 1 from Pago Pago. Length 38 to 83 mm. The type of *Salarias paulus* in the Bishop Museum, also 2 from Rarotonga and 2 from Agaña on Guam. Largest 118 mm. The National Museum has 5 from Apia, 1 from Mangareva, and 1 from Makemo.

Bourbon, India, Andamans, East Indies, Melanesia, Micronesia, Polynesia.

Salarias dussumieri Valenciennes.

Salarias dussumieri Valenciennes: Hist. nat. Poiss., vol. 11, p. 229, 1836 (type loc., Malabar).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 229, 1898 (Marianas).

Head 4; depth 4 1/4; D. XIII; 21; A. II, 19; no lower canines; lips entire. Color in alcohol faded pale brownish, with some very fine brown dots on cranium. Traces of dull brown spots along hind side of trunk in about 3 rows. Lower edge of anal and caudal dull brownish. No tentacle at nape or above eye. Length 13 to 38 mm.

The Bishop Museum has 6 from Palmyra Island obtained by C. Montague Cooke in 1913. These young specimens appear to be this species, having the dorsals deeply notched and extending nearly to the caudal.

Red Sea, Zanzibar, Cape of Good Hope, India, Andamans, Queensland, Micronesia, Polynesia.

Salarias geminatus Alleyne and Macleay.

Salarias geminatus Alleyne and Macleay: Linn. Soc New South Wales, Proc., vol. 1, p. 336, pl. 13, fig. 3, 1877 (type loc., Torres Straits).

Related to *Salarias dussumieri* but differs in the absence of the occipital crest and the soft dorsal and caudal are with dark borders. According to McCulloch and McNeill reaches 107 mm.

Two in the National Museum from Fiji, obtained by the Wilkes Expedition.

Salarias poptae (Fowler) (fig. 74).

Rupiscartes poptae Fowler: B. P. Bishop Mus., Bull. 22, p. 19, 1925 (type loc., Guam).

with rosy-red along each spine. Soft dorsal similar, only red less in evidence and confined to basal portions. Caudal yellowish, margined above and below narrowly dusky. Anal whitish basally, dusky terminally. Pectoral brownish, splashed with reddish basally. Ventral grayish. Iris reddish, slender supraorbital tentacle 2/3 of eye. Length 74 to 83 mm.

In the Bishop Museum the type of *Salarias tubuensis* and 1 from Palmyra Island through Thurston and Thaanum in 1922. Although Seale says "no canines" a small pair of lower ones are distinctly visible in his type. The National Museum has 4 from Mangareva. Also 2 in the Agassiz Museum from Mangareva.

Salarias sindonis differs in no especial way

FIGURE 74.—Drawing of *Salarias poptae*.

Only the type known, in the Bishop Museum. The species is distinguished by the presence of 4 broad pale vertical bands on the cheek.

Salarias biseriatus Valenciennes.

Salarias biseriatus Valenciennes: Hist. nat. Poiss., vol. 11, p. 234, 1836 (type loc., Indian Archipelago).—Kner: Reise "Novara," Fische, vol. 2, p. 198, pl. 8, fig. 5 (non 4) 1865 (Tahiti).—Günther: Mus. Godeffroy. Jour., vol. 6, pt. 11, p. 208, 1877 (Tahiti).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1411, 1906 (Savaii).

Alticus biseriatus Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 156, pl. 7, fig. 2, 1912 (Mangareva, Gambier Islands).

Salarias tubuensis Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 87, fig. 8 (no. 784) 1906 (type loc., Tubuai, Austral Islands).

Salarias sindonis Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 427, fig. 105, 1905 (1906) (type loc., Pago Pago).

Head 4 3/4 to 4 7/8; depth 5 to 5 1/6; D. XIII, 20; A. II, 21; head width 1 1/2 to 2 in its length; snout 3 to 3 1/4 in head; eye 3 1/8 to 3 4/5; maxillary 2 1/8 to 2 3/5.

Least depth of caudal peduncle 2 to 2 1/5 in head; fourth dorsal spine 1 1/2 to 2; fourth dorsal ray 1 1/3 to 1 2/3; fourth anal ray 1 4/5 to 2 1/10; caudal 1; pectoral 1 to 1 1/10; ventral 1 1/2. Pair of lower canines.

Color in alcohol with sides coppery. Back rosy-maroon, variegated deeper rosy spots anteriorly. Along side 8 obscure grayish blotches, mostly double. Short pale bar vertically behind eye, its hind edge blackish. Behind this obscure dusky horizontal streak and another parallel from mouth. Cheek and side of head with very numerous close-set dark pin points. Several gilded blotches on opercle. Spinous dorsal yellowish, splashed

from the young of this species. The type was 25 mm. long.

East Indies, Polynesia.

Salarias meleagris Valenciennes.

Salarias meleagris Valenciennes: Hist. nat. Poiss., vol. 11. p. 246, 1836 (type loc., "Tasmania").—Schmeltz: Mus. Godeffroy, Cat. 4, p. 19, 1869 (Viti Islands).—Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 208, pl. 116, fig. D, 1877 (New Caledonia).—Peters: Akad. Wiss. Berlin, Monatsb., p. 841, 1876 (1877) (New Hannover).—Waite: Austral. Mus., Records, vol. 5, p. 3, 1903 (Paanopa, Ocean Island, Gilbert Group).—Seale: B. P. Bishop Mus.. Occ. Papers, vol. 4, no. 1, p. 86, 1906 (Nukuhiva; Makatea).—Weber: Siboga Exped., vol. 65, p. 535, 1913 (Wunoh Bay; North West Waigiu).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 10, no. 7, p. 389, 1923 (Honolulu).

A well marked species, readily known by its crenulate border to the upper lip, the lower lip entire. Supraocular tentacles branched. No lower canines. Dorsal fin notched between spines and rays. Coloration with small light ocelli. (McCulloch and McNeill)

In the Bishop Museum 1 from Waikiki on Oahu through C. H. Edmondson in 1922, 3 from Laie Bay on Oahu through C. Montague Cooke III in November, 1922, 1 from Laysan through W. A. Bryan in April-May, 1903, and 12 from Makatea.

According to McCulloch and McNeil "this species was said to have been originally obtained by Peron in Tasmania, but no species of the genus occurs so far south." More likely the type may have been obtained in the East Indies.

Zanzibar, Bourbon, East Indies, Melanesia, Micronesia, Polynesia, Hawaii.

Salarias mccullochi Fowler and Bean.

Salarias mccullochi Fowler and Bean: U. S. Nat. Mus., Proc., vol. 63, p. 25, 1923 (type loc., Bellingshausen Island).

Apparently related to *Salarias meleagris* in the crenulate upper lip, but differs in more dorsal rays (23 compared with 19 or 20) and the contrasted median lateral yellowish longitudinal band.

The type, 90 mm. long, in the National Museum.

Salarias caudolineatus Günther.

Salarias caudolineatus Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 209, pl. 116, fig. F, 1877 (type loc., Tahiti).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 87, 1906 (Makatea, Nukuhiva).—Fowler and Bean: U. S. Nat. Mus., Proc., vol. 71, p. 15, 1927 (Tahiti).

Alticus caudolineatus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 423, 1905 (1906) (Apia; Pago Pago).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 326, 1911 (Rangiroa, Paumotus).

Rupiscartes caudolineatus Fowler: B. P. Bishop Mus., Bull. 22, p. 36, 1925 (Samoa).

Salarias garmani Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 429, fig. 107, 1905 (1906) (type loc., Apia).

Head 3 4/5 to 4 2/5; depth 5 to 5 2/3; D. XII or XIII, 20 or 21; A. II, 20 to 22; snout 2 1/2 to 3 1/5 in head; eye 3 1/6 to 3 2/5; maxillary 2 1/8 to 2 1/2; mouth width 2; interorbital 2 to 2 1/2 in eye.

Body moderately long, well compressed. Least depth of caudal peduncle 2 1/3 in head. Head moderate, front profile vertical, width 1 1/4 to 1 2/3 in its length. Snout wide, length half its width at front of eye. Eye elevated, larger than snout, hind edge at first third in head length. Mouth broadly transverse, gape extending opposite hind pupil edge. Lips entire. Maxillary reaches opposite hind eye edge. Teeth fine, slender, close-set, edges forming even undulations. Pair of inner lower canines. Front nostril with short bifid tentacle; hind nostril little higher, simple pore close before eye. Supraorbital tentacle slender, simple, 2/3 of eye. Median cutaneous flap on head moderate. Interorbital narrowly concave.

Gill opening extends forward for last fourth of head, membranes forming broad free fold across broad isthmus. Gill rakers 4 + 8 short points, 1/5 of gill filaments, which 1 2/5 in eye. Pseudobranchiae long as gill filaments. Skin smooth. Lateral line incomplete, arch in front not quite extending far as depressed pectoral tip. Dorsal begins opposite last sixth in head, moderately deep notch separating posterior section of fin; fourth dorsal spine 2 1/10 in head; origin of second dorsal midway between hind eye edge and caudal base and fin joined by membrane with caudal basally; second dorsal ray 1 4/5. Anal begins little before soft dorsal origin or much nearer snout tip than caudal base, edge of fin with tips of rays free; fifth anal ray 2 1/10 in head. Caudal rounded behind, 1 1/5 in head. Pectoral similar, though lower rays little longer, reaches 4/5 to anal; 1 1/10 in head. Ventral jugular, reaches half way to anal; 1 2/3 in head.

Color in alcohol pale brown generally. On side 4 dusky longitudinal lines, broken behind to form fine black spots. Fins all pale. On marginal portions of spinous dorsal 2 irregular blackish dots. On soft dorsal 3 rows of fine blackish dots. Caudal with 7 or 8 transverse rows of fine blackish dots. Caudal brownish, darker submarginally, with tips of rays white and on posterior half of fin row of fine black dots. Iris pale slaty. Length 43 to 68 mm.

In the Bishop Museum 1 from Makatea. The Academy has 5 from Apia. The National Museum has 1 from Fiji obtained by the Wilkes Expedition. Others are 4 from Apia and 1 Rangiroa, obtained by the Bureau of Fisheries. The Agassiz Museum has 6 from Apia and 1 from Rangiroa.

Likely *Salarias garmani* Jordan and Seale is the young.

Salarias beani new species.

Salarias hasselti (non Bleeker) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1 p. 87, 1906 (Faté, New Hebrides).

Head 4 1/2; depth 5 1/3; D. XIII, 22; A. II, 21; P. 15; V. 2; snout 3 1/3 in head measured from upper jaw tip; eye 4; mouth width 2 2/3; maxillary 2 2/5; interorbital 2 1/2 in eye.

Body strongly compressed, oblong. Least depth of caudal peduncle 2 2/5 in head.

Head strongly compressed, evenly convex above and below; upper profile convex and very gibbous, that of snout inclined backward; head width 1 7/8 in its length. Snout broadly convex, length 2/3 its width. Eye high, anterior, impinging on upper front profile. Maxillary extends back beyond eye. Lips entire. Teeth fine, in even series in each jaw; strong canine each side below. Front nostril with fringed flap, 1/3 of eye. No supraorbital tentacle. Low median longitudinal cutaneous crest on top of head. No supraoccipital filaments. Interorbital narrowly concave.

Gill opening extends forward about midway in head. Gill rakers 12? weak short points, 1/5 or less in gill filaments, which 1 1/2 in eye.

Skin smooth. Lateral line distinct, superior, extends far as end of depressed pectoral.

Spinous dorsal begins opposite upper hind edge of gill opening, fin deeply incised and last dorsal ray joined with caudal basally by membrane; first dorsal spine 2 in head; fifth ray 1 3/5. Anal begins well before soft dorsal, margin of fin incised along each membrane; fifth anal ray 1 3/4 in head. Caudal with hind edge convexly rounded; fin 1 1/8 in head. Pectoral reaches 3/4 to anal, lower rays longest, fin 1 1/8 in head. Ventral jugular, inserted at last fourth in head; fin 1 7/8 in head.

Color in alcohol livid lilac-brown. Along edge of back 8 obscure deeper broad saddles and along sides as many dark blotches of similar width. Spinous dorsal dusky, with many oblique parallel lines of blackish. Soft dorsal pale brown, with 5 deep brown longitudinal lines. Anal pale or whitish, marginally broad blackish-brown. Caudal pale brown, lower edge blackish brown. Pectoral and ventral brown. Iris slaty. Length 86 mm.

Type, No. 1063 Bishop Museum. Faté, New Hebrides. April-May 1903. Collection of Alvin Seale.

This species approaches *Salarias caudolineatus* but has no supraorbital tentacle. Its canines are large and strong and the coloration is different. (Named for Barton A. Bean of the United States National Museum).

Salarias sumatranus Bleeker.

Salarias sumatranus Bleeker: Nat. Tijds. Ned. Ind., vol. 1, p. 256, 1850 (type loc., West Sumatra).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 19, 1869 (Kanathia).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 149, 1913 (Saonek, Waigiu).

Head 6 in total; depth 5; D. XII, 20; A. 22. No canines. Short simple supraorbital tentacle, another at occiput; nasal tentacle bifid. Dorsal deeply notched, continuous with caudal; second dorsal lower than body, higher than first dorsal or anal. Grayish. First dorsal with blackish longitudinal bands, posterior with numerous oblique yellow stripes, superiorly with longitudinal series of black dots. Caudal green. Anal with 2 or 3 rows of brown dots. (Günther)

East Indies.

Salarias aequipinnis Günther.

Salarias aequipinnis Günther: Cat. fishes Brit. Mus., vol. 3, p. 253, 1861 (type loc., Amboina).—De Vis: Linn. Soc. New South Wales, Proc., vol. 8, p. 450, 1883 (type loc., (South Sea Islands).

Head 7 in total; depth 10; D. XVI, 18; A. 25. Very short tentacle above hind portion of orbit, none on neck. No canines. Dorsal inserted opposite pectoral base, emarginate, ends before caudal. Sometimes second dorsal spine produced in filament long as head, rest of fin rather lower than second dorsal fin, which high as body. Caudal rounded. Pectoral nearly reaches vent. Ventral short, outer spine thick and cartilaginous. Dark olive, spotted darker, spots arranged in 10 vertical bands. Dorsal fins and caudal rays black. Anal immaculate, with black marginal band leaving free tips of rays white. Length 72 mm. (Günther)

Salarias lineatus Valenciennes.

Salarias lineatus Valenciennes: Hist. nat. Poiss., vol. 11, p. 232, 1836 (type loc., Java).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 5, 1859 (Doreh, New Guinea).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 86, 1906 (Faté).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1411, 1906 (Savaii).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 426, 1905 (1906) (Apia; Pago Pago).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 617, 1908 (Suva, Fiji).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 326, 1911 (Arhno Atoll, Marshalls; Fakarava, Paumotus).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 158, 1912 (Mangareva).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 149, 1919 (Saonek, Waigiu).—McCulloch and McNeil: Australian Mus., Records, vol. 13, p. 18, pl. 4, fig. 1, 1918 (New Hebrides).—Fowler and Bean: U. S. Nat. Mus., Proc., vol. 71, p. 15, 1927 (Tahiti).—Fowler: B. P. Bishop Mus., Bull. 38, p. 30, 1927 (Tongareva).

Head 5; depth 5 1/3; D. XII, 23; A. II, 24; snout 3 1/2 in head measured from snout trip; eye 5 1/4; mouth width 2; interorbital 2 in eye.

Body evenly compressed, slender, though scarcely tapering. Least depth of caudal peduncle 2 2/5 in head.

Head wide, slightly approximated above, width 1 2/5 in its length; front profile slightly inclined backward. Snout broadly convex in front, length 2/3 its width at front of eye. Eye anterior, impinging on upper profile; supraocular tentacle 1 2/3 in eye, edge finely fringed. Mouth wide, inferior. Upper lip with slightly crenulate edge, lower entire. Teeth fine, uniserial; no canines. Front nostril with fleshy flap half of eye in length, fringed. Interorbital narrowly concave. Median longitudinal cutaneous cranial flap well developed. No filament at occiput. Gill rakers rudimentary.

Skin smooth. Dorsals with median notch between spines and rays and last ray joined by membrane with caudal base; first dorsal spine 1 1/2 in head; third dorsal spine 1 3/5. Anal inserted little before soft dorsal or at first 2/5 in space between snout tip and caudal base, edge of each membrane slightly notched and last ray free from caudal; tenth anal ray 1 1/2 in head. Caudal rounded behind, long as head. Pectoral rounded, nearly reaches vent, 1 2/5 in head. Ventral inserted at last fourth in head; 2 in head.

Color in alcohol dark or dusky, nearly uniform. Sometimes belly citrine-drab and side of body with 6 dark narrow longitudinal lines, variable, paler or obsolete on costal region. Dorsals dull brown, rayed fin with numerous close-set oblique dusky lines, sometimes crowded fine marginally. Spinous dorsal and anal darker terminally. Other fins brownish. Head slaty.

The Bishop Museum has 1 from Faté, 107 mm. long. In the Agassiz Museum 2 from Mangareva and 1 from Arhno Atoll. In the National Museum 1 from Fiji?, obtained by the Wilkes Expedition. Also 2 from Honolulu through W. H. Pease, 3 Apia, 3 Fakarava and 2 Mangareva.

Red Sea, India, Andamans, East Indies, Queensland, Melanesia, Micronesia, Polynesia, Hawaii.

Salarias oortii Bleeker.

Salarias oortii Bleeker: Nat. Tijds. Ned. Ind., vol. 1, p. 257, 1850 (type loc., Tjilankahan, Java).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 19, 1869 (Kanathia).

Head 6 to 7 in total; depth 7 to 7 1/2; D. XII, 19 to 21; A. 23 or 24. Forehead not projecting beyond mouth. Small lower canines present, scarcely visible in young. Rounded crest or crown on head. Interorbital concave. Short fringed supraorbital tentacle and 1 at nostril. Dorsal deeply notched, continuous with caudal; second fin higher, high as body, higher than anal. Rose-colored, with violet crossbands in pairs, broader than interspaces between. First dorsal violet, with several undulated whitish longitudinal stripes. Second dorsal violet, yellow along middle, with oblique stirpes inferiorly and reticulated with blue superiorly. Anal rose-colored at base, marginal half violet. Caudal yellow, brownish at base and edges, latter reticulated with blue. (Günther)

Zanzibar, East Indies, Polynesia.

Salarias bilitonensis Bleeker.

Salarias bilitonensis Bleeker: Nat. Tijds. Ned. Ind., vol. 15, p. 231, 1858 (type loc., western Biliton).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 139, 1913 (Saonek, Waigiu).

Head 6 1/2 to 6 2/3 in total: depth 8 to 8 1/2; D. XII, 20; A. 20 to 21. Forehead not prominent; interorbital concave. Head with crest; simple tentacle above orbit and fringed one at nostril. Lower canine present. Dorsal emarginate, reaches caudal. Greenish rose. Transverse blue streak below and another behind eye. Opercle with blue spot. Body with 8 or 9 brownish cross bars and 10 longitudinal brown streaks. Spinous dorsal with brown blue edged spots. Lower half of soft dorsal with oblique brown streak, upper reticulated with violet and blue. Anal with violet margin and numerous bluish spots. (Günther).

East Indies.

Salarias unicolor Rüppell.

Salarias unicolor Rüppell: Neue Wirbelth., Fische, p. 136, 1835 (type loc., Massaua, Red Sea).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 229, 1898 (Guam).

Head 4 1/3 to 4 1/2; depth 4 7/8 to 5; D. XII, 17 or 18; A. 18 or 19. Forehead not projecting beyond mouth. Eye prominent, 1 1/2 to 2 in snout, 1/2 diameter apart. Male with median crest and fringed tentacle twice long as eye above orbit; another short tentacle at nostril; female without median crest and supraocular tentacle long as eye. No canines. Dorsals deeply notched, first fin lower than second, not continuous with

caudal. Olive brown, with distinct blackish blotches along side and extended on dorsal fin; 2 or 3 rows of blue spots on body and head. Female olive-brown, white beneath, marbled all over with brown lines forming large insulated spaces. Head and upper 2/3 of body dotted with light blue. Fins yellowish. Dorsal and anal horizontally and sinuously banded in spots. Caudal with 5 or 6 vertical dark bands. Brown band divided by light blue line at pectoral base, which yellowish barred with brown. Length 118 mm. (Day)

Red Sea, Mozambique, India, Micronesia.

Salarias caesius Seale.

Salarias caesius Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 88, fig. 8 (No. 785), 1906 (type loc., Tubuai, Austral Islands).

Alticus biseriatus (non Valenciennes) Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 427, 1905 (1906) (Pago Pago).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 125, fig. 2, 1922 (Pago Pago).

Salarias biseriatus Fowler: B. P. Bishop Mus., Bull. 22, p. 36, 1925 (Samoa).

Alticus margaritatus Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 137, pl. 7, fig. 3, pl. 8, fig. 1, 1912 (type loc., Pago Pago, Samoa).

In the Bishop Museum the type of *Salarias caesius,* and 5 paratypes same data, 48 to 55 mm. long. Although Seale states "no canines" there are a pair of small inconspicuous ones posteriorly. Also 2 from Tahiti through C. H. Edmondson. In the National Museum a series of Samoan specimens and 2 types of *Alticus margaritatus.* The Agassiz Museum has 19 from Pago Pago. The Academy has 24 from Pago Pago, 21 to 58 mm. long.

Salarias goesi Bleeker.

Salarias goesi Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. (3) 19, 1859 (type loc., Doreh, New Guinea).—Bleeker: Nat. Tijds. Ned. Ind., vol. 20, p. 93, 1859-60 (New Guinea).

Head 6 in total; depth 8; D. XIV, 19; A. 20. No lower canines. Slightly fringed supraorbital tentacle. Nasal tentacle simple. Dorsal moderately notched, soft fin higher and not continuous with caudal. Violet-rose with darker dots, crowded on back as crossbands. Dorsal irregularly spotted with brown. Caudal with 3 transverse series of blackish spots. Pectoral with some black spots on rays. Anal and ventral immaculate. (Günther)

East Indies.

Salarias interruptus Bleeker.

Salarias interruptus Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 68, 1857 (type loc., Kajeli).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 19, 1869 (Samoa).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 149, 1913 (Saonek, Waigiu).

Head 6 in total; depth 7 to 7 1/2; D. XII, 19; A. 21. Forehead not projecting beyond mouth. Lower canine present. Short supraorbital tentacle and 1 above nostril. Interorbital rather concave. Dorsal deeply notched, first fin rather lower than second fin, nearly equal in height to anal; second fin somewhat less than body depth. Body with short brown longitudinal streaks. Dorsal with 3 or 4 series of brown spots. Anal edge brown. Caudal dotted with brown. (Günther)

East Indies, Polynesia.

Adamia cyclocheilus Weber.

Adamia cyclocheilus Weber: Leyden Museum, Notes, vol. 31, no. 2, p. 143, 1909 (type loc., Ajatuning, New Guinea).—Weber: Siboga Exped., vol. 65, p. 538, pl. 3, fig. 3, 1913 (Ajatuning).

Head 5 2/3; depth 7; D. XV, 19 or 20; A. 24 or 25. Eye high, impinging on upper profile, 3 in head. Dorsal not notched, posterior rays little higher than spines. Anal with membranes notched terminally. Head spotted and body marbled darker. Length 73 mm. (Weber)

Enchelyurus ater (Günther).

Petroscirtes ater Günther: Mus. Godeffroy, Jour., vol. 6, pt. 11, p. 199, pl. 115, fig. E, 1877 (type loc., Tahiti).

Enchelyurus ater Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, p. 500, fig. 222, 1903 (1905) (Honolulu; Waikiki; Samoa).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 434, 1905 (1906) (Pago Pago; Apia).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 126, 1922 (Pago Pago).—Jordan and Jordan: Carnegie Inst., Mem., vol. 10, no. 1, p. 83, Dec., 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 30, 36, 1925 (Honolulu; Samoa).—Fowler and Ball. B. P. Bishop Mus., Bull. 26, p. 29, 1925 (Laysan and Lisiansky islands).

Salarias atratus Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 361, 1882 (type loc., New Guinea).

Aspidontus brunneolus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 510, fig. 50, 1902 (1903) (type loc., Honolulu).—Snyder: op. cit., vol. 22, p. 536, 1902 (1904) (Honolulu).

Hypleurochilus vaillanti Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 420, fig. 102, 1905 (1906) (type loc., Pago Pago).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 325, 1911 (Fakarava, Paumotus; type).

Head 3 1/3 to 3 2/5; depth 4 to 4 1/5; D. 30 or 31; A. 20 or 21; snout 3 to 3 1/5 in head; eye 2 1/4 to 2 3/5; maxillary 2 1/3 to 3; interorbital 1 2/5 in eye. In alcohol dusky-brown, fins blackish.

In the Academy 2 from Pago Pago 18 or 19 mm. The National Museum has the type of *Aspidontus brunneolus,* 4 from Waikiki, 1 from Fakarava and a series from Samoa. In the Bishop Museum 1 from Honomuni on Molokai through W. A. Bryan in July 1914, and 7 from Waikiki through C. H. Edmondson in 1922. Largest 30 mm. Also 3 from Laysan and 1 from Lisiansky in 1923. One in the Agassiz Museum from Fakarava.

Hypleurochilus vaillanti is evidently the same species, the type only 14 mm. long. I cannot but think *Salarias atratus* is a synonym even though the dorsal is said to be "profoundly notched, forming in fact two fins." It was based on a specimen 77 mm. long, which is greatly larger than any known to me. *Salarias niger* (Ehrenberg) Valenciennes (Hist. nat. Poiss., vol. 11, p. 242, 1836) from the Red Sea, may be this species. It is noticed as follows: Depth nearly 4 in total length. No canines. D. 24. A. 13. Profile vertical. Dorsal reaches base of anal. Black. Length 35 mm.

Enchelyurus edmondsoni Fowler (fig. 75).

Enchelyurus edmondsoni Fowler: B. P. Bishop Mus., Occ. Papers, vol. 10, no. 7, p. 389, 1923 (type loc., Honomuni, Molokai).

One in the Bishop Museum from Honomuni on Molokai, obtained by W. A. Bryan in July 1914. Its color-pattern shows dark oblique lines on the fins, black blotch at front of spinous dorsal and longitudinal dark bands on the trunk. Soft dorsal, anal and caudal continuous.

Congrogadus subducens (Richardson).

Machaerium subducens Richardson: Ann. Mag. Nat. Hist. London, vol. 12, p. 175, pl. 6, 1843 (type loc., west Australia).

Congrogadus subducens Peters: Akad. Wiss. Berlin, Monatsb., p. 842, 1876 (1877) (New Guinea).—Günther: Rept. voyage "Challenger," vol. 1, p. 45, 1880

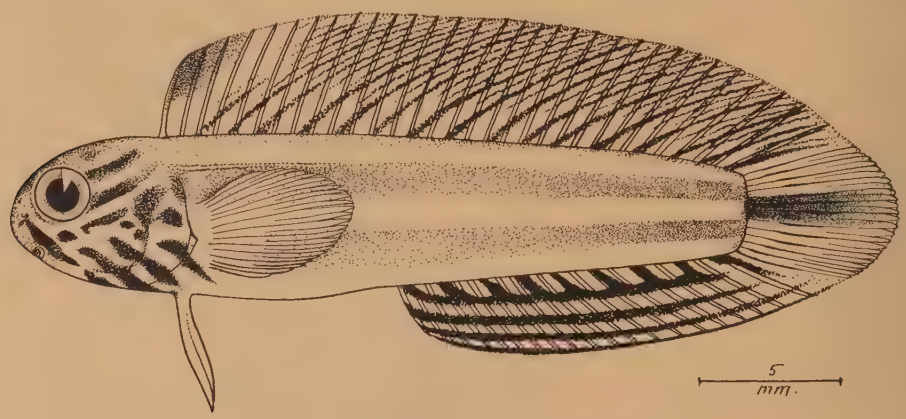

FIGURE 75.—Drawing of *Enchelyurus edmondsoni*.

XIPHASIIDAE

Xiphasia setifer Swainson.

Xiphasia setifer Swainson: Nat. hist. An., vol. 2, p. 259, 1839 (on *Ophidium tonkah-talawaree* Russell: Fishes of Coromandel, vol. 1, p. 28, pl. 39, 1803, type loc., Vizagapatam).

Nemophis lessoni Kaup: Zool. Soc. London, Proc., p. 168, fig., 1858 ("From MM. Lesson and Garnot. without any note; as they were obtained in the expedition of M. Duperrey, I presume they were captured in the South Sea").

Known by its long eel-like body, compressed behind, depth 15 or more. Snout obtuse. Eye large, about 3. Lower jaw with pair of long, curved, wide-set canines. Interorbital less than eye. Gill rakers 1 + 7 feeble points. Skin smooth, naked. Vertical fins confluent, dorsal beginning on interorbital. Brown. Dorsal blackish, other fins pale. Reaches 200 mm. or more.

Natal, Madagascar, India.

XENOCEPHALIDAE

Xenocephalus armatus Kaup.

Xenocephalus armatus Kaup: Archiv Naturgesch., pt. 1, p. 85, 1858 (type loc., New Ireland).

D. 7; A. 10. Body small. Head large, with plates and spines. Eye moderately large. Teeth in both jaws, none on palate. One dorsal and anal, slightly separated from large caudal. Pectoral present. Vent in hind half of body. Head shields yellowish-brown, naked skin between blackish. Eye golden-yellow, eyelid with dark dots. Body blackish-brown, with black spots on back. Belly golden-yellow. Fins yellowish-white. (Kaup)

CONGROGADIDAE

Congrogadus marginatus Vaillant and Sauvage.

Congrogadus marginatus Vaillant and Sauvage: Rev. Mag. Zool., 3rd ser., vol. 3, p. 282, 1875 (type loc., Hawaiian islands).

Head 6 1/2 to 7 in total. Teeth 40 in each jaw, median upper longer and curved backward. Dorsal inserted above pectoral origin. Uniform brown, head deeper. Narrow black border along dorsal and upper caudal lobe. Length 130 mm. (Vaillant and Sauvage) (south of New Guinea in S. Lat. 10° 30′ E. Long. 142° 18′).

Head 6 1/2 to 7 in total; depth 1 2/3 in head; D. 71; A. 60 to 65. More than 40 small teeth in each jaw each side. Dorsal begins above end of pectoral. Body brownish, uniform or irregularly marbled or spotted. Black ocellus on opercle. Lower part of cheeks with pearl-colored spots. Bases of dorsal and anal with bluish spots. (Günther)

East Indies, West and North Australia.

LYCODAPODIIDAE

Snyderidia canina Gilbert.

Snyderidia canina Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 655, pl. 92, 1903 (1905) (type loc., Kauai in 385 to 500 fathoms).

Head 8 1/2; depth 10; snout 5 3/4 in head; eye 5 1/4; maxillary 2; interorbital 5 3/4. Body compressed, tapers in long slender tail. Upper profile little concave above front of eye. Mouth oblique, mandible included. Enlarged fang-like teeth in jaws, on vomer and palatines. Head without spines. Gill rakers 3, short. No scales or lateral line. Dorsal begins close behind pectoral origin, confluent with anal around slender tail; anal begins about first 2/5 in depressed pectoral, which 1 1/4 in head. No ventrals. Light grayish, almost concealed by rounded uniform pigment spots. Tail terminally, mouth, gill cavity and peritoneum blackish. Fins translucent. Length 309 mm. (Gilbert)

Dinematichthys iluocoeteoides Bleeker.

Dinematichthys iluocoeteoides Bleeker: Nat. Tijds. Ned. Ind., vol. 8, p. 319, 1855 (type loc.. Batu Archipelago).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 435, 1905 (1906) (Apia; Pago Pago).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 336, 1909 (Ponapé; Tahiti).

Head 4 1/2; depth 4 1/2; D. 76 to 83; A. 60 to 69. Snout obtuse, longer than small eye. Scales very small. Pectoral broad, 1 1/2 in head. Dorsal inserted over middle of pectoral. Body greenish, grayish or red. Length 102 mm. (Günther)

In the National Museum 3 from Apia.

East Indies, Micronesia, Polynesia.

BROTULIDAE

Brotula maculata Day.

Brotula maculata Day: Zool. Soc. London, Proc., p. 196, 1868 (type loc., Madras).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 332, 1909 (New Guinea).

Head 5 1/2 in total; depth 5 1/2; D. 100 to 115; A. 97 to 107. Interorbital nearly equals eye, which long as snout or 5 in head. Jaws equal, upper reaches below eye. Six upper barbels long as eye, 6 lower somewhat longer. Palatine band of teeth broad as front part of maxillary band and long as eye. Anal begins head length posterior to head. Pectoral 2 in head, nearly long as inner ventral ray. Vertical fins with narrow blackish, also whitish border. Length 280 mm. (Günther)

India, East Indies.

Brotula multibarbata Schlegel.

Brotula multibarbata Schlegel: Fauna Japonica, Poiss., pts. x—xiv, p. 251, pl. 111, fig. 2, 1846 (type loc., Simabara Bay).[—Schmeltz: Mus. Godeffroy, Cat. 4, p. 24, 1869 (Savay).—Regan: Zool. Soc., London, Proc., pt. 1, p. 406, 1909 (Christmas Island, Indian Ocean).] Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 30, 1925 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 38, p. 32, 1927 (Honolulu).

Brotula multicirrata Vaillant and Sauvage: Rev. Mag. Zool., 3rd ser., vol. 3, p. 282, 1875 (type loc., Hawaiian islands).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 946, 1904 (Honolulu).

Brotula townsendi Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 518, pl. 20, fig. 3, 1900 (type loc., Hawaiian islands).

Brotula marginalis Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 403, fig. 16, 1899 (1901) (type loc., Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 21, 1902 (Honolulu).—Jenkins: op. cit., vol. 22, p. 510, 1902 (1903) (type).—Snyder: op. cit., vol. 22, p. 536, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 507, fig. 225, 1903 (1905) (Honolulu).

Head 4 1/2; depth 4 1/3; D. 95; A. 81; C. 10; scales 96? in lateral line; 10 scales above lateral line, 24 below; 40 predorsal scales; snout 4 1/8 in head; eye 8; maxillary 1 3/5; interorbital 5 1/2. Gill rakers iv + 3, ix, lanceolate, 1 1/5 in eye. Scales with 56 to 66 radiating striae; circuli moderate. Edges of vertical fins dusky.

Type of *Brotula townsendi* in the Academy. The Bishop Museum has 11 from Honolulu, largest 593 mm. I also found 1 in the Honolulu market December 20, 1922. The type of *Brotula marginalis* in the National Museum, besides 6 from Honolulu.

Japan, Hawaii.

Brotula mulleri Günther.

Brotula mülleri Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 334, 1909 (type loc., Ponapé; Tahiti).

Head 5 1/2 to 6 in total; depth 5 1/2 to 6; D. 110 to 132; A. 97 to 101. Interorbital nearly equals eye or snout, which 5 in head. Upper jaw reaches below hind eye edge. Six upper barbels long as eye, 6 lower longer. Pectoral nearly half long as head; ventral filament 1 1/2 in head, forked. Vertical fins marginally black, with narrow white edge. Length 280 mm. (Günther)

Brotula ensiformis Günther.

Brotula ensiformis Günther: Cat. fishes Brit. Mus., vol. 4, p. 372, 1862 (type loc., Aneiteum, New Hebrides).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 17, 1877 (Pelew Islands).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 333, 1909 (types).

Head 6 or more in total; depth 6 or 7; D. 127 to 135 (158); A. 103 to 117. Interorbital nearly equals eye, which somewhat shorter than snout. Upper jaw reaches below eye. Six upper barbels on snout and 6 on chin. Opercle ends posteriorly in spine. Ventral with 2 rays, outer free terminally and inner 2/3 long as head. Vertical fins margined dark. Length 381 mm. (Günther)

Mauritus, Melanesia.

CARAPIDAE

Carapus homei (Richardson).

Oxybeles homei Richardson: Voyage "Erebus" and "Terror," Fishes, p. 74, pl. 44, figs. 7-18, 1844-48 (type loc., Australian Seas?; Timor).

Fierasfer homei Günther: Cat. fishes Brit. Mus., vol. 4, p. 382, 1862 (Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 24, 1869 (Samoa).—Peters: Akad. Wiss. Berlin, Monatsb., p. 844, 1876 (1877) (Lucipara Island, New Britain, New Hannover).—Jouan: Soc. Cherbourg, Mem., vol. 21, p. 333, 1877-78 (New Caledonia).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 374, 1897 (Rotuma).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 523, 1900 (Tahiti).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 510, 1901 (Samoa).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 435, 1905 (1906) Apia; Pago Pago).—Jordan and Snyder: op. cit., vol. 26, p. 217, 1906 (1907) (Honolulu).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 338, 1900 (Fiji; Samoa; Tahiti; Raiatea; Rotuma; New Britain; Society Islands).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 390, 1923 (Honolulu).

Fierasfer homii Ogilby: Australian Mus., Records, vol. 1, p. 7, 1890-91 (Howla Island, Shortland).—Waite: Australian Mus., Mem., no. 3, p. 194, 1897 (Funafuti, Ellice Islands).

Tierasfer homei Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1419, 1906 (Savaii).

Carapus homei Fowler: B. P. Bishop Mus., Bull. 22, p. 38, 1925 (Tahiti).—Fowler and Bean: U. S. Nat. Mus., Proc., vol. 71, p. 15, 1927 (Tahiti).

Fierasfer microdon Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 655, fig. 254, 1903 (1905) (type loc., between Maui and Lanai in 32 to 43 fathoms).

Head 6 4/5 to 8 1/3; depth 10 4/5 to 14; pectoral 1 3/4 to 2 1/4 in head; snout 5 to 5 1/2; snout length 2/3 to 4/5 its own width; eye 4 1/10 to 4 1/4 in head, greater than snout; maxillary 1 7/8 to 2 1/8 in head, reaches beyond eye; interorbital 4 1/8 to 5 1/2 in head, slightly convex. Gill rakers ii + 10, short, lanceolate, long as gill filaments or 1/3 of eye.

Head compressed, flattened, sides equally converging above and below, width 2 1/2 in its length. Lower jaw little shorter than upper. Teeth above with well-developed inner row and several slight canines forward. Maxillaries form narrow band of smaller similar teeth. Mandible with strong outer row of teeth and narrow inner band of smaller ones. Several enlarged teeth on vomer and narrow band of small teeth on each palatine.

Color in alcohol uniform pale brown. Opercle below and on each myomere below median axis or of vertebral column, pale golden or gilded blotch, each larger than pupil, for about first 10 to 13 myomeres.

In the Academy 5 from Tahiti, obtained by Andrew Garrett. Length 88 to 148 mm. The Bishop Museum has 2 from Honolulu and 1 from Waikiki from a holothurian, obtained by W. A. Bryan April 29, 1915. Largest 136 mm. One from Samoa in the National Museum. In the

Agassiz Museum 7 from the Society Islands through Andrew Garrett, 1 from Ascension Island in the Marshalls through Rev. A. A. Sturges and 1 from the Kingsmills, taken from a starfish.

Jouan describes a *Fierasfer* from Kanala, New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 252, 1861), 80 to 100 mm. long. Evidently on account of its robust form this species.

Bourbon, East Indies, Queensland, Melanesia, Micronesia, Polynesia, Hawaii.

Carapus parvibrachium Fowler (fig. 76).

Carapus parvibrachium Fowler: B. P. Bishop Mus., Bull. 38, p. 31, fig. 6, 1927 (Suva Bay, Fiji).

Known only from the type and paratype in the B. P. Bishop Museum, former larger or 81 mm. long. Distinguished by its compressed deep body, short pectoral and dentition.

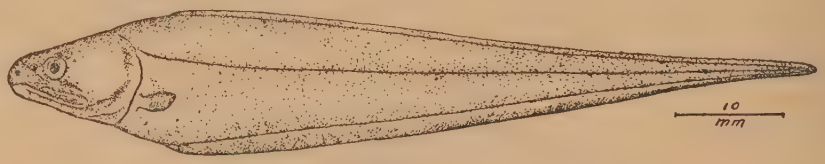

FIGURE 76.—Drawing of *Carapus parvibrachium*.

Jordanicus parvipinnis (Kaup).

Fierasfer parvipinnis Kaup: Cat. apod. fish Brit. Mus., p. 160, pl. 16, fig. 2, 1856 (type loc., Carteret Harbor, New Ireland).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 35, 1874 (Samoa).—Peters: Akad. Wiss. Berlin, Monatsb., p. 844, 1876 (1877) (New Hannover).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 374, 1897 (Rotuma).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 523, 1900 (Tahiti).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 338, 1909 (Ponapé; New Ireland; New Hannover; Tahiti; Raiatea; Oualan; Rotuma).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 330, 1911 (Papeete, Tahiti).

Jordanicus parvipinnis Fowler and Silvester: Carnegie Inst., Marine Pap., p. 126, 1922 (Pago Pago).—Fowler: B. P. Bishop Mus., Bull. 22, p. 38, 1925 (Tahiti).

Distinguished from *Carapus homei* in more robust head and sides strongly swollen. Head 9 in total; depth 11 1/2. Gill rakers 3 well-developed, long as gill filaments or 4/5 of eye.

In the Academy 1 from Tahiti obtained by Andrew Garrett and 1 from Pago Pago. Length 90 and 174 mm. The National Museum has 1 from Papeete. In the Agassiz Museum 2 from the Society Islands through Andrew Garrett. Larger 190 mm.

The Pago Pago specimen agrees in every way except that the brown pigment spots are very much coarser and larger and therefore less numerous. They present a somewhat irregular crowded pattern.

Melanesia, Micronesia, Polynesia.

Jordanicus boraborensis (Kaup).

Fierasfer boraborensis Kaup: Cat. apod. fish Brit. Mus., p. 160, 1856 (type loc., Borabora).

Head 10 or 11 in total. Vomer with round cluster of thick teeth. Pectoral about 6 in head. Length 560 mm. (Kaup)

Jordanicus gracilis (Bleeker).

Oxybeles gracilis Bleeker: Nat. Tijds. Ned. Ind., vol. 11, p. 105, 1856 (type loc., Banda).

Fierasfer gracilis Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 300, 1868 (Waigiu).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 17, 1877 (Pelew Islands).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 38, 1878 (New Guinea).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser, vol. 20, p. 374, 1897 (Rotuma).

Jordanicus gracilis Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 339, 1909 (Pelew Islands; Samoa; Society Islands; Fiji; Tonga; Wallis Island; Rotuma).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 390, 1923 (Honolulu).

Fierasfer umbratilis Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 206, 1902 (1903) (type loc., Hilo).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 946, 1904 (Hilo).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 505, 1903 (1905) (Hilo).

Jordanicus umbratilis Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, pl. 61, 1903 (1905).—Gilbert: op. cit., vol. 23, pt. 2, p. 656, 1903 (1905) (Puako Bay).

Apparently differs from *Jordanicus boraborensis* in the larger pectoral about 3 in head.

One from Waikiki, taken by W. A. Bryan on July 22, 1914. "The eel was inside the holothurian and only crawled out after 4 or 5 hours in the boat." Length 168 mm. One from Honolulu, also in the Bishop Museum, obtained by J. W. Thompson in 1919. Pale in color, with large dusky scattered pigment spots, numerous on muzzle. Also 3 from Kahola on Oahu, on November 16, 1920, by C. H. Edmondson.

The type of *Fierasfer umbratilis* in the National Museum.

Natal, East Indies, Micronesia, Polynesia, Hawaii.

Jordanicus caninus (Günther) (fig. 77).

Fierasfer caninus Günther: Cat. fishes Brit. Mus., vol. 4, p. 383, 1862 (no type locality).

FIGURE 77.—Drawing of *Jordanicus caninus*.

Jordanicus caninus Fowler: B. P. Bishop Mus., Bull. 38, p. 30, fig. 5, 1927 (Christmas Island).

Known by its slender body and long pectoral, which half of head, also pronounced dentition.

Two in the B. P. Bishop Museum from Christmas Island, larger 75 mm.

Rhizoiketicus carolinensis Vaillant.

Rhizoiketicus carolinensis Vaillant: Acad. Paris, Comptes rendus, vol. 117, p. 746, 1893 (type loc., Caroline Islands).

Differs from *Carapus* in the lozenge-shaped imbedded scales.

Encheliophis vermicularis J. Muller.

Encheliophis vermicularis J. Muller: Akad. Wiss. Berlin, Abhandl., p. 154, pl. 4, figs. 4-5, 1843 (anatomy) (type loc., Philippine Islands).—Günther: Mus. Godeffroy, Jour., vol. 8, pt. 16, p. 339, 1909 (Tahiti).

According to Müller differs in the absence of pectorals. Body compressed, tail tapering back in long point. Blackish-brown. Length 102 mm.

Philippines, Polynesia.

BATRACHOIDIDAE

Pseudobatrachus dubius (Shaw).

Lophius dubius Shaw: Voyage New South Wales, White, vol. 1, p. 265, fig., 1790 (type loc., New South Wales).

Batrachus dubius Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 267, 1883 (southeast New Guinea).

Head 2 3/4 to 3, broad as or broader than long; D. III, 19 or 20; A. 16; eye 1 1/4 in snout, little over interorbital, which 6 2/3 in head. Front teeth in jaws biserial. Vomerine teeth uniserial. One subopercular spine. Above dark brown, blotches and marbled lighter. Lower portion of tail with obscure whitish spots. Fins brown. Dorsal with 2 or 3 inconspicuous oblique whitish bars. Anal with similar bars and free tips of many of the rays white. Length 188 mm. (Ogilby)

East Coast of Australia, New Guinea.

Coryzichthys diemensis (Le Sueur).

Batrachoides diemensis Le Sueur: Acad. Nat. Sci. Philadelphia, Proc., vol. 3, pt. 2, p. 402, 1824 (type loc., Tasmania).—Günther: Rept. voyage "Challenger," vol. 1, p. 44, 1880 (off New Guinea in S. Lat. 10° 30′ E. Long. 142° 18′).

Batrachus diemensis Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 150, 1913 (Beo, Majalibit Bay, Waigiu).

Batrachus grunniens (non Linné) Macleay: Linn. Soc., New South Wales, Proc., vol. 7, p. 360, 1882 (New Guinea).

Differs from *Pseudobatrachus dubius* in the absence of the axillary pore, and the presence of narrow bands of small cardiform teeth. Violet to purplish-black above to pearl-gray or lilac below. Tail usually with 4 lighter crossbands, some with upper half of bands, like spinous dorsal and cheeks, scarlet or orange. Caudal lilac, with lighter transverse bars. Paired fins violaceous-gray with or without broad median and basal purple bands. Length 220 mm. (Ogilby)

India, Australia, New Guinea.

GOBIESOCIDAE

Crepidogaster lineatum Sauvage.

Crepidogaster lineatum Sauvage: Soc. Philom. Paris, Bull., 7th ser., vol. 7, p. 158, 1882 (type loc., New Caledonia).

D. 16; A. 14. Body naked, rough. Snout narrow, very depressed. Mandible included. Mouth slightly inclined. Eyes lateral, equal interorbital. Dorsal and anal confluent with caudal. Reddish. Clear line from snout tip to dorsal base. Clear line along each side of flanks below. Length 40 mm. (Sauvage)

Crepidogaster samoensis Steindachner.

Crepidogaster samoensis Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1408, 1906 (type loc., Upolu).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 124, 1922 (Pago Pago).

Head 2 3/5 to 3 1/8; depth 6 to 7 1/3; D. 10; A. 8; snout 3 1/4 to 3 3/5 in head; eye 4 to 4 1/4; mouth width 3 1/5 to 3 2/3; interorbital 4 to 4 1/3.

Head and fore part of body depressed. Snout depressed, length 3/4 its width. Eye high, anterior, less than snout. Mouth small, upper jaw much longer. Band of fine teeth in each jaw. Nostrils each in short raised tubes, distinct, though close together. Interorbital slightly concave. Disk free all around sides and behind. Dorsal and anal far back, close to caudal, which convex behind. Vent nearly anal length before origin of fin. When fresh in alcohol nearly uniform pink.

In the Academy 2 specimens from Pago Pago, 19 to 25 mm.

Trachelochismus pinnulatus (Schneider).

Lepadogaster pinnulatus (Forster) Schneider: Systema ichth., Bloch, p. 2, 1801 (type loc., Indian Sea near New Zealand).

Trachelochismus pinnulatus Günther: Cat. fishes Brit. Mus., vol. 3, p. 509, 1862 (Fiji; Oualan).—Kner: Akad. Wiss. Wien, Sitz., vol. 57, pt. 1, p. 347, 1868 (Fiji).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 21, 1869 (Samoa).—Schmeltz: op. cit., Cat. 5, p. 31, 1874 (Viti Islands).—Günther: Mus. Godeffroy. Jour., vol. 7, pt. 15, p. 223, 1881 (Oualan; Fiji).

D. 8; A. 7. Front part of body broad and depressed. Snout depressed, produced, triangular, broader than long. Nostrils with short tentacles. Jaws with patch of small teeth in front and series on sides; incisors none. Skin tough, naked. Gill membranes extend from one side to the other, free from isthmus Carmine-red, with purplish and yellowish cross-streaks on occiput. Body and fins with yellowish spots. (Günther)

New Zealand, Polynesia.

TRIACANTHIDAE

Triacanthus strigilifer Cantor.

Triacanthus strigilifer Cantor: Asiatic Soc. Bengal. Jour. (Cat. Malay. Fish.), vol. 18, pt. 2, p. (363) 1345, pl. 9, 1849 (type loc., Sea of Pinang).—Bleeker: Atlas ichth., vol. 5, p. 89, pl. (15) 229, fig. 3, 1865 (New Guinea).

According to Regan differs from the other species in the second dorsal spine more than half length of first. Head 3; depth 3; D. V-20 to 22; A. 15 or 16. Spinous dorsal without black spot. Length 185 mm.

Arabia, India, East Indies.

Triacanthus blochii Bleeker.

Triacanthus blochii Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 81, 1852 (type loc., Singapore).

Triacanthus blochi Bleeker: Atlas ichth., vol. 5, p. 89, pl. (3) 217, fig. 1, 1865 (New Guinea).

In this species and in *T. biaculeatus* the second dorsal spine subequal with the third. According to Regan it agrees with *Triacanthus oxycephalus* in the first dorsal immaculate. Head 3 1/2 to 3 4/5; depth 3; D. V-22 or 23; A. 16 or 17. Length 150 mm.

East Indies, China.

Triacanthus biaculeatus (Bloch).

Balistes biaculeatus Bloch: Nat. ausländischen Fische,

pt. 2, p. 17, pl. 148, fig. 2, 1786 (type loc., East India).

Triacanthus macrurus Bleeker: Atlas ichth., vol. 5, p. 91, pl. (8) 222, fig. 3, 1865 (type loc., Batavia, Java; New Guinea).

Resembles *Triacanthus blochii* and *Triacanthus oxycephalus* in the profile of the snout concave, according to Regan. Head 3 1/2; depth 2 4/5; D. V-23 or 24; A. 18 or 19. Membrane between first and second dorsal spines blackish. Length 180 mm.

East Indies, Australia, China.

Triacanthus oxycephalus Bleeker.

Triacanthus oxycephalus Bleeker: Bataviaasch Genoot., Verh. (Balist.), vol. 24, p. 27, pl. 5, fig. 10, 1852 (type loc., Batavia, Java; Padang, Sumatra).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 38, 1878 (New Guinea).

According to Regan differs from all the others in its very short caudal peduncle. Head 3; depth 2 1/3 to 2 1/2; D. V-24 or 25; A. 17 to 19. Length 140 mm.

East Indies.

Triacanthus brevirostris Schlegel.

Triacanthus brevirostris Schlegel: Fauna Japonica, pt. 15, p. 294, pl. 129, fig. 2, 1850 (type loc., Japan).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 98, 1860 (New Guinea).—Bleeker: Atlas ichth., vol. 5, p. 91, pl. (17) 231, fig. 3, 1865 (New Guinea).

Triacanthus rhodopterus Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 98, 1860 (New Guinea).

This species with dark or black blotch on spinous dorsal. Head 3 1/4 to 3 3/4; depth 2 1/2 to 2 3/4; D. V-24 to 25; A. 18 to 20. Length 250 mm. (Regan)

East Indies, China, Japan.

BALISTIDAE

Thiollière has reported a figure by Montrouzier as *Balistes assasi* Forskål (Fauna Woodlark, p. 216, 1857, Woodlark Island), stating that it is like the figure of *Balistes aculeatus* Rüppell (Atlas Reis Nord. Afrika, Fisch., p. 27, pl. 7, fig. 1, 1828), which is placed as a synonym of Forskål's fish. Apparently *Balistes assasi* is otherwise not known extralimital to the Red Sea.

Abalistes stellaris (Schneider).

Balistes stellaris Schneider: Systema ichth., Bloch, p. 476, 1801 (type loc., Indian Sea) (On *Le Baliste etoilé* Lacépède: Hist. nat. Poiss., vol. 1, pp. 333, 350, pl. 15, fig. 1, 1799, type loc., Mauritius).—Hollard: Ann. Sci. Nat. Zool., vol. 1, p. 320, pl. 5, fig. 2, 1854 (East Indies, New Ireland, Pacific Ocean, eastern Asia).

Balistes stellatus Günther: Cat. fishes Brit. Mus., vol. 8, p. 212, 1870 (Louisiades).—Günther: Rept. voyage "Challenger," vol. 1, p. 36, 1860 (Kandavu, Fiji).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 437, 1910 (New Mecklenberg; New Ireland).

Readily known by the depressed caudal peduncle and 2 ridges each side. According to Bleeker reaches 356 mm.

Red Sea, Zanzibar, Mozambique, Mauritius, India, Ceylon, East Indies, China, Queensland, Melanesia, Polynesia.

Canthidermis maculatus (Bloch) (Pl. XLIV, *A*).

Balistes maculatus Bloch: Nat. ausländischen Fische, pt. 2, p. 25, pl. 151, 1786 (type loc., "American waters").—Hollard: Ann. Sci. Nat. Zool., vol. 1, p. 58, pl. 3, figs. 2-3, 1854 (dorsal and caudal fin) (East Indies and Pacific Ocean).—Günther: Rept. voyage "Challenger," vol. 1, p. 57, 1880 (north of Admiralty Islands).

Balistes (Canthidermis) maculatus Bleeker: Atlas ichth., vol. 5, p. 122, pl. (4) 218, fig. 4, 1865 (New Guinea).

Canthidermis maculatus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8. no. 7, p. 387, 1923 (Honolulu).

Balistes azureus Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 121, pl. 10, fig. 2, 1830 (type loc., New Guinea).

Balistes willughbeii Bennett: Zool. Soc. London, Proc., vol. 1, p. 168, 1831 (on *Guaperua longa* Willughby: Ichth., pl. 1, fig. 20, 1865) [Lay and Bennett: Beechey's voyage, Zool., p. 68, pl. 21, fig. 2, 1839, Pacific Ocean near Acapulco]

Balistes brevissimus Hollard: Ann. Sci. Nat. Zool., vol. 1, p. 56, pl. 3, fig. 1, 1854 (type loc., New Guinea and Australia).

Balistes longissimus Hollard: Ann. Sci. Nat. Zool., vol. 1, p. 60, pl. 3, fig. 3, 1854 (type loc., Pacific Ocean).

Head 3 2/5; depth 2 7/8; D. III-III, 21; A. III, 19; scales 38 between gill opening and caudal base and 4 more on latter; 26 scales from rictus to gill opening; 35 scales between spinous dorsal origin and pubic spine; snout 1 3/4 in head measured from upper jaw tip; eye 5 1/3; interorbital 2 1/8; head width 1 3/4.

Body compressed, contour fusiform. Caudal peduncle well compressed, least depth 1 1/5 in its length or 2 3/4 in total head length. Upper profile of head mostly convex. Snout compressed, width 1 2/5 in its length. Eye posterior. Mouth small, chin slightly protrudes. Lips rather wide, largely cover teeth. Teeth broadly notched, 4 above each side and 3 below. Short deep groove before eye, equals latter. Nostrils small pores, separated, in depression immediately above with posterior about 3/5 eye diameter before eye. Interorbital broadly convex. Gill opening little inclined from vertical forward, slightly longer than eye.

Scales rough, each with slightly enlarged tubercle forward, smaller on head and base of caudal. Lateral line very irregular, curves high at first then drops low above middle of anal, finally median along side of caudal peduncle. Spinous dorsal origin above that of pectoral, first spine 2 1/5 in total length of head, and front edge roughly rugose. Soft dorsal origin midway between front nostril and caudal base, with elevated pointed lobe forward, second branched ray 1 1/5 in total head length. Anal similar, opposite soft dorsal, second branched ray 1 1/4 in head. Caudal small, 1 2/5 in head, trilobate behind (upper edge of point worn?). Pectoral close behind lower edge of gill opening, 2 1/6 in total head length. Pubic spine roughly denticulate; flap behind smooth.

Color in alcohol dull sepia generally. Body marked everywhere with round pale spots, smaller above, large and more crowded below or on abdomen. Spinous dorsal brown. Other vertical fins dull sepia with obscure pale spots basally. Pectoral dull brownish. Iris pale slaty.

One in the Bishop Museum from Honolulu, 306 mm., taken in 1908. Two in the National Museum from Hawaii and 2 from Samoa.

As *Balistes* No. 6 described by Jouan from Kanala, New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 246, 1861): D. III—27; A. 24. Head depressed. Eyes moderate, somewhat distant. Mouth small. Teeth 8. Scales rectangular. Caudal little trifurcate. Pectoral small. Grayish, with citron-yellow spots. Length 500 mm.

Cape of Good Hope, India, China, Japan, East Indies, Melanesia, Polynesia, Hawaii. Also tropical and subtropical Atlantic.

Canthidermis rotundatus (Proce).

Balistus rotundatus Proce: Soc. Philom. Paris, Bull., p. 130, 1822 (type loc., Manilla Bay).

Canthidermis rotundatus Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 387, 1923 (Honolulu).

Balistes angulosus Quoy and Gaimard: Voyage "Uranie," Zool., p. 210, 1824 (type loc., Hawaii).—Hollard: Ann. Sci. Nat. Zool., vol. 1, p. 57, 1854 (Pacific Ocean).

Canthidermis angulosus Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 85, pl. 4, fig. 3, Dec., 1922 (Honolulu).

Balistes um Thiollière: Fauna Woodlark, p. 217, 1857 (type loc., Woodlark Island).

Balistes munumum Thiollière: Fauna Woodlark, p. 218, 1857 (type loc., Woodlark Island).

Balistes (Canthidermis) oculatus Bleeker: Atlas ichth., vol. 5, p. 121, pl. (4) 218, fig. 2, 1865 (New Guinea).

Balistes oculatus Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 438, 1910 (Admiralty Islands).

Canthidermis oculatus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 514, 1900 (Hawaiian islands).

Balistes (Linrus) aureolus Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 517, 1901 (Laysan).

Balistes senticosus Richardson: Voyage "Samarang," Fishes, p. 23, pl. 9, figs. 5-8, 1848 (type loc., Sea of China).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 437, 1910 (Samoa; Yap; Ponapé).

Head 2 3/5 to 2 2/3; depth 1 3/4; D. III-1, 25 or 26; A. 1, 23 or 24; P. 1, 14; scales 42 to 57 between head and caudal base and 3 to 6 more on latter; 18 to 34 scales from rictus to gill opening; 30 to 54 scales from spinous dorsal origin to pubic spine; snout 1 2/3 to 1 3/4 in head; eye 3 1/8 to 4; interorbital 2 1/5 to 2 2/5.

Body well compressed, contour rounded. Caudal peduncle well compressed; length 2/3 its least depth (long as deep in young), which 2 3/5 in head. Head width half its length, upper profile slightly undulate, slightly convex in young. Snout compressed, width 1 1/2 its length, 1 1/3 in young. Eye high, closer to profile in young. Mouth small. Papillose lips nearly cover teeth. Teeth well notched, 4 above each side and 3 below. Short groove before eye and below nostrils, which close together. Interorbital flattened; supraocular regions convex, more evenly convex in young. Gill opening little oblique from vertical, equals eye, more nearly vertical in young and about 1 3/5 in eye. Scales quite rough, finer and smaller on head, caudal peduncle and about dorsal and anal bases, much larger in young. Lateral line not evident.

Spinous dorsal origin over that of pectoral and first spine (broken) likely long as snout?, with row of rough denticles on each side forward and several in front, inserted little before gill opening and length 1 1/4 in head in young. Soft dorsal origin about midway between hind eye edge and caudal base, front median rays highest. Anal origin opposite soft dorsal origin, fin similar. Caudal small, rounded behind, 1 5/6 in head, 2 1/6 in young. Pectoral inserted close behind lower edge of gill opening, 2 1/4 in head, about 2 1/2 in young. Pubic spine denticulate, flap behind with 11 denticles, shorter and less distinct in young.

Color in alcohol nearly uniform warm buff, buckthorn brown on top of head and back above. Fins dull brownish. Soft dorsal with obscure brown blotch on middle of highest rays, with whitish shade in front and behind. Caudal dark brown. Iris whitish. Length 51 to 113 mm.

Two in the Academy from the Hawaiian islands, obtained by J. K. Townsend. Interest attaches to these specimens as they are the only ones of the species in any American Museum. Jordan and Evermann have identified them from my record of *Canthidermis oculatus* as *Canthidermis angulosus* from Quoy and Gaimard, though omitted this reference otherwise from the body of their text. Their copied accounts from Quoy and Gaimard, and Günther, show that the latter's *Balistes maculatus* is more in agreement. Quite likely Steindachner's record of a young specimen from Laysan Island as *Balistes (Linrus) aureolus,* is the same. Finally Weber, under *Balistes (Canthidermis) rotundatus,* places both *Balistes senticosus* Richardson and *Balistes oculatus* Gray as synonyms (Siboga Exped., vol. 65, p. 577, pl. 10, fig. 14, 1913) though Günther (1910) admitted them distinct. There seems to be little in Günther's contention. Even the size of the eye, when the other features are computed, would likely be only variation. Weber's figure, except for the dark marking (which likely have faded out after my specimens were eighty or more years in alcohol), agrees in most all ways with my larger specimens.

East Indies, Melanesia, Hawaii.

Balistes vidua Richardson (Pl. XLIV, *B*).

Balistes vidua (Solander) Richardson: Voyage "Sulphur," Fishes, p. 128, pl. 59, figs. 9-10, 1844 (type loc., Polynesia, Tahiti).—Hollard: Ann. Sci. Nat. Zool., vol. 1, p. 319, 1854 (Borabora).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 98, 1860 (New Guinea).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 5, 1859 (1860) (Doreh, New Guinea).—Günther: Cat. fishes Brit. Mus., vol. 8, p. 216, 1870 (Tahiti; probably type).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 39, 1874 (Samoa; Tahiti).—Streets: U. S. Nat. Mus., Bull., no. 7, p. 57, 1877 (Honolulu).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 516, 1901 (Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 18, 1902 (Honolulu).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 482, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 534, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 409, pl. 61, 1903 (1905) (Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 73, 1906 (Nukuhiva).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 361, 1905 (1906) (Pago Pago).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 438, 1910 (Hawaii; Society Islands; Kingsmills; Samoa; Marquesas; Ponapé; Mortlock).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 333, 1911 (Tahiti).—Fowler: B. P. Bishop Mus., Bull. 22, p. 30, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 29, 1925 (French Frigates Shoal, Johnston and Wake islands).

Melichthys vidua Bleeker: Atlas ichth., vol. 5, pp. 107, 109, pl. (3) 217, fig. 2, 1865 (New Guinea).

Sufflamen vidua Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 84, Dec. 1922 (Honolulu).

A handsome species with blackish body, pale or whitish fins, soft dorsal and anal each narrowly margined blackish.

The Bishop Museum has 5 from Honolulu and 1 from Nukuhiva, largest 287 mm. I found 1 in the Honolulu market in November,

1922 and another in December. Also 2 from French Frigates Shoal, 2 Johnston Island and 1 Wake Island in 1923. In the National Museum 1 Hawaiian specimen obtained by the Wilkes Expedition, 1 from Tahiti through William Stimpson and 1 through the Bureau of Fisheries, 1 Hawaiian through T. H. Streets and a series from the Bureau of Fisheries, 1 Samoa. The Agassiz Museum has 1 from Tahiti and 5 from the Society Islands through Andrew Garrett on September 29, 1861.

East Indies, Micronesia, Polynesia, Hawaii.

Balistes nycteris (Jordan and Evermann).

Pachynathus nycteris Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 199, 1902 (1903) (type loc., Honolulu).

Balistes nycteris Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, no. 1, p. 408, fig. 179, 1903 (1905) (type).

Head 3 1/10; depth 1 7/8; D. III-33; A. 29; scales 68 between gill opening and caudal base; 36 scales transversely between soft dorsal and anal origins; snout 1 1/3 in head measured from upper jaw tip; eye 5; interorbital 2 2/3; gill opening 4 4/5. Least depth of caudal peduncle 3 2/5 in head. Head width 1 9/10 in its length. First dorsal spine 2 1/10 in head; third dorsal ray 2 3/5; fifth anal ray 2 3/4; caudal 1 7/8; pectoral 2 7/8.

Color in alcohol chocolate-brown. Lips pale brown. Spinous dorsal brown, edge black. Soft dorsal pale brown with 4 longitudinal dark brown lines, basal most distinct. Anal similar, only with 2 longitudinal dark lines and these on basal half of fin. Caudal deep brown, slightly convex behind and with corners broadly pale or whitish above and below. Pectoral pale. Iris slaty. Six dark lines radiate from eye above, first in nasal groove forward on snout, second through nostrils, last to base of first dorsal spine. Two lines from eye down on cheek, posterior to middle of gill opening.

Two in the Bishop Museum 118 to 159 mm. from Honolulu. In the National Museum the type of *Pachynathus nycteris*.

Balistes chrysopterus Schneider.

Balistes chrysopterus Schneider: Systema ichth., Bloch, p. 466, 1801 (type loc., Coromandel) (On *Le Baliste sillonne* Lacépède: Hist. nat. Poiss., vol. 1, pp. 334, 370, pl. 18, fig. 2, 1799, type loc., China; East Africa).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 73, 1906 (Faté).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 362, 1905 (1906) (Apia).

Pyrodon niger (nen Bloch 1786) Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, pp. 3, 5, 1859 (Doreh, New Guinea).

Balistes niger Günther: Cat. fishes Brit. Mus., vol. 8, p. 218, 1870 (Aneiteum; Micronesia).—Günther: Cruise of "Curaçoa" (Brenchley), p. 410, 1873 (Solomons).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 39. 1874 (Samoa).—Peters: Akad. Wiss. Berlin, Monatsb., p. 852, 1876 (1877) (New Britain).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 228, 1898 (Rota, Marianes).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 439, 1910 (Pelew Islands; Ponapé; New Hannover; Samoa; Friendly Islands; Kingsmills; Aneiteum; Faté; Duke of York Islands).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 333, 1911 (Jaluit, Marshalls).

Balistes (*Balistapus*) *niger* Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1413, 1906 (Upolu).

Head 2 7/8; depth 2; D. III-27; A. 24; scales 43 from gill opening in median lateral series to caudal base; scales 38 transversely; snout 1 2/5 in head; eye 5; interorbital 3 7/8; gill opening 4. Least depth of caudal peduncle 4 1/5 in head. Head width 2 1/10 in its length. Caudal peduncle side with 7 rows of thorns. First dorsal spine 2 in head; fourth dorsal ray 2 3/4; fourth anal ray 2 7/8; caudal 1 7/8; pectoral 2 7/8.

Largely dark sepia-brown in alcohol. Lips, soft dorsal, anal, edges of caudal, both above, below and posteriorly whitish. Spinous dorsal dusky. Pectoral dull brownish. Eye slaty.

In the Bishop Museum 3 from Faté, largest 152 mm. The National Museum with 1 from Jaluit and 2 from Tahiti through William Stimpson. The Agassiz Museum has 3 from Apiang through Andrew Garrett.

Red Sea, Zanzibar, Mozambique, Mauritius, Seychelles, India, Ceylon, East Indies, China, Queensland, Melanesia, Micronesia, Polynesia.

Balistes capistratus Shaw (Pl. XLIV, *C*).

Balistes capistratus Shaw: Gen. zool., vol. 5, p. 417, 1804 (on *Le Baliste bride* Lacépède: Hist. nat. Poiss., vol. 1, pp. 335, 378, 1799, no type locality).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 411, fig. 181, 1903 (1905) (Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 74, 1906 (Nukuhiva).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 333, 1911 (Makemo, Paumotus).—Fowler: B. P. Bishop Mus., Bull. 22, p. 30, 1925 (Honolulu).

Pachynathus capistratus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 483, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 534, 1902 (1904) (Honolulu).

Sufflamen capistratus Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 85, Dec., 1922 (Hawaii).

Balistes mitis Bennett: Zool. Soc. London, Proc., vol. 1, p. 169, 1831 (type loc., Mauritius).—Günther: Cat. fishes Brit. Mus., vol. 8, p. 218, 1870 (type; Observatory Island, Bellona's; Gonzales Island).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 18, 1902 (Honolulu).

Balistes frenatus Hollard: Ann. Sci. Nat. Zool., vol. 1, p. 322, pl. 5, fig. 3, 1854 (type loc., Atlantic Ocean; Madagascar; Polynesia).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).

Balistes castaneus (non Richardson) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 17, 18, 19, 1902 (Honolulu).

Dusky-brown with fins paler. Dull yellowish ring around lower jaw, sometimes joining yellow streak from rictus variably towards pectoral, again absent.

The Bishop Museum has 9 from Honolulu and 3 from Nukuhiva. Length 387 mm. of largest specimen. I found 239 specimens in the Honolulu markets in December 1922 and January 1923. In the National Museum 1 from Tempe in the Marquesas through W. H. Jones on June 23, 1883, 3 adult Hawaiian specimens and 1 from Makemo.

Zanzibar, Natal, Madagascar, Reunion, Mauritius, East Indies, China, Queensland, Melanesia, Polynesia, Honolulu.

Balistes bursa Schneider (Pl. XLV, *A*).

Balistes bursa Schneider: Systema ichth., Bloch, p. 476, 1801 (type loc., Indian Ocean) (on Rozier: Jour.,

vol. 3, pl. 1, 1774).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 5, 1859 (Doreh, New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 28, 1869 (Samoa; Viti Islands).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 18, 1902 (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 410, fig. 180, 1903 (1905) (Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 73, 1906 (Nukuhiva).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).

Balistes (Balistapus) bursa Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 38, 1878 (New Guinea).

Balistapus bursa Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 510, 1900 (Hawaiian islands).

Pachynathus bursa Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 483, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 534, 1902 (1904) (off Diamond Head, Oahu, 27 to 29 fathoms).

Sufflamen bursa Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 83, Dec., 1922 (Honolulu).

Head 3; depth 2 1/5; D. III-11, 26; A. 1, 24; scales 54 between head and caudal base and 2 more on latter; 32 scales between rictus and gill opening; 41 scales between spinous dorsal origin and pubic spine; snout 1 1/4 in head; eye 6; interorbital 3 5/6; head width 2; horizontal spinous keels along trunk 23, most pronounced behind, 6 extending on caudal peduncle.

Pale brown, but slightly paler on abdomen. Lips very pale brown. Pale line from rictus to anal origin. Dark brown line from eye to spinous dorsal base, then down till before pectoral base. Another similar colored line up from gill opening toward spinous dorsal base. Spinous dorsal membranes deep brown, edge of first membrane and most of second and third terminally whitish. Pubic spine and ventral flap edged dusky. Dorsal, anal and pectoral little paler brown than caudal.

The Academy has a Hawaiian specimen from W. H. Jones, 203 mm. In the National Museum 1 from Fiji, obtained by the Wilkes Expedition, 158 mm. Also 2 from Tahiti through William Stimpson and 9 Hawaiian, of which 1 from T. H. Streets, others mostly from the Bureau of Fisheries. The Bishop Museum has 5 from Honolulu and 2 from Nukuhiva. Largest 195 mm. I examined 206 specimens in the Honolulu markets in December 1922. The Agassiz Museum has 4 from Honolulu through W. H. Jones in 1874 and 9 from the Society Islands through Andrew Garrett.

Red Sea, East Africa, Madagascar, Bourbon, Mauritius, East Indies, Polynesia, Hawaii.

Balistes conspicillium Schneider.

Balistes conspicillium Schneider: Systema ichth., Bloch, p. 474, 1801 (type loc., Indian Seas).—Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 112, pl. 9, fig. 1, 1830 (Oceania; Carolines; New Ireland; New Guinea).—Hollard: Ann. Sci. Nat. Zool., vol. 1, p. 326, 1854 (Equatorial Seas).—Kittlitz: Denkw. Reise Mikronesien, vol. 2, p. 161, 1858 (Ulea).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 441, 1910 (Ovalau).

Balistes (Balistapus) conspicillium Bleeker: Atlas ichth., vol. 5, p. 116, pl. (73) 221, fig. 2, 1865 (New Guinea).

D. III-25 or 26; A. 21 or 22; lateral line 46, transversely scales 29. Tail with 3 rows of tubercles. Patch of enlarged scales behind gill opening. Brownish-black, with very large round white spots on lower half. Back between dorsal fins lighter, center of each scale brown. White band across back of snout, from one eye to other. End of snout white, with narrow white ring. Caudal white, with broad basal band, edge black. Length 332 mm. (Günther)

Madagascar, Bourbon, Mauritius, East Indies, China, Japan, Formosa, Melanesia, Micronesia, Polynesia.

Balistes viridescens Schneider.

Balistes viridescens Schneider: Systema ichth., Bloch, p. 477, 1801 (on *Le Baliste verdatre* Lacépède: Hist. nat. Poiss., vol. 1, pp. 335, 378, pl. 16, fig. 3, 1799, type loc., Mauritius).—Hollard: Ann. Sci. Nat. Zool., vol. 1, p. 324, 1854 (Red Sea; New Guinea).—Peters: Akad. Wiss. Berlin, Monatsb., p. 852, 1876 (1877), (New Guinea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 595, 1882 (New Guinea).

Balistes (Pseudobalistes) viridescens Bleeker: Atlas ichth., vol. 5, p. 112, pl. (17) 231, fig. 2, 1865 (New Guinea).

D. III—24 or 25; A. 23; lateral line 29, transversely scales 18. Tail with 5 rows of recurved spines. Snout scaly to lips, without naked on tubercular spaces, with exception of fold behind mouth angle. Few small osseous scutes behind gill opening. Nearly uniform brownish or brownish-olive. Diffuse blackish band between eye and pectoral base. Scales generally with dark centers. Hind caudal edge blackish. Length 160 mm. (Günther)

Two in the National Museum from Port Moresby, New Guinea.

Red Sea, Zanzibar, Mauritius, East Indies.

Balistes ringens Linné (Pl. XLV, *B*).

Balistes ringens Linné: Systema nat., 10th ed., p. 329, 1758 (type loc., Ascension Island).—Hollard: Ann. Sci. Nat. Zool., vol. 1, p. 317, 1854 (East Indies, Pacific Ocean, Antilles).

Balistes armatus Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 28, 1869 (Samoa).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 595, 1882 (New Guinea).

Balistes aureolus Richardson: Voyage "Sulphur," Fishes, p. 126, pl. 59, figs. 1-2, 1844 (no type locality).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 39, 1874 (Pacific Ocean).

Xanthichthys lineopunctatus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 416, fig. 182, 1903 (1905) (Hilo; Honolulu).—Jordan and Snyder; (U. S.) Bur. Fish., Bull., vol. 26, p. 217, 1906 (1907) (Honolulu).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 616, 1908 (Honolulu).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 164, 1912 (Cook Bay, Easter Island).

A handsome species, known by its protruding mandible, 3 or 4 narrow naked horizontal lines on cheek and scales of tail keeled.

The Bishop Museum has 6 from Honolulu 105 to 232 mm. In the National Museum 1 from Fiji, obtained by the Wilkes Expedition. Also through the Bureau of Fisheries 2 Hawaiian and 2 from Cook's Bay on Easter Island. One in the Agassiz Museum from Easter Island.

Mauritius, East Indies, Hawaii, also tropical Atlantic and eastern Pacific.

Balistes fuscus Schneider (Pl. XLV, *C*).

Balistes fuscus Schneider: Systema ichth., Bloch, p. 471, 1801 (on Lacépède: Hist. nat. Poiss., vol. 1, p. 378, 1798, no type locality).—Günther: Rept. voyage "Challenger," vol. 1, p. 36, 1880 (Kandavu, Fiji).—Mac-

leay: Linn. Soc. New South Wales, Proc., vol. 7, p. 595, 1882 (New Guinea).—Waite: Australian Mus., Mem., no. 3, p. 196, 1897 (Funafuti, Ellice Islands).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 73, 1906 (Tahiti).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 442, pl. 168, 1910 (Ponapé; Fiji; Society Islands; Kingsmills).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 387, 1923 (Honolulu).

Balistes reticulatus Hollard: Ann. Sci. Nat. Zool., vol. 1, p. 312, 1854 (type loc., Pacific Ocean; Bourbon Island).

Xanthichthys rivulatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 73, 1906 (Faté).

Head 2 3/5 to 2 4/5; depth 1 2/3 to 2; D. III-27; A. 23 or 24; snout 1 1/4 to 1 3/4 in head; eye 3 to 6; interorbital 3. Least depth of caudal peduncle 3 2/5 to 4 1/5 in head. Head width 1 4/5 to 1 7/8 in its length. First dorsal spine 1 4/5 to 2 in head; fifth dorsal ray 1 2/5 to 2 1/4; fifth anal ray 1 3/5 to 2 1/4; caudal to ends of median rays 1 5/6 to 2 1/8; pectoral 2 3/4 to 2 7/8.

In the Bishop Museum 6 from Honolulu, 347 to 529 mm. All more or less dark brown in alcohol, some with fins with pale edges and others obscurely with fine spots. One of larger ones much darker than the others, but with edges of soft dorsal and anal uniform blackish in alcohol. Caudal and pectoral narrowly whitish. All show sides of caudal peduncle without rows of tubercles, or spines, or keels. Also a specimen from Faté, 55 mm. Black blotch on back also includes spinous dorsal. Black blotch larger below soft dorsal and another on side of caudal peduncle, also one on interorbital. About 14 or 15 dark brown longitudinal lines on trunk, some on head. Several dark streaks on caudal basally and one along soft dorsal and anal basally. In the Agassiz Museum 4 from Apiang through Andrew Garrett, largest 357 mm. Also half-grown specimen from the Society Islands through Andrew Garrett.

Red Sea, Zanzibar, Bourbon, East Indies, Melanesia, Micronesia, Polynesia, Hawaii.

Balistes flavimarginatus Rüppell.

Balistes flavimarginatus Rüppell: Atlas Reise Nord. Afrika, Fische, p. 33, 1828 (type loc., Djedda, Red Sea).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 5, 1859 (Doreh, New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 39, 1874 (Upolu; Tahiti).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 595, 1882 (New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 73, 1906 (Shortland Island).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 362, 1905 (1906) (Apia).—Fowler: B. P. Bishop Mus., Bull. 22, p. 20, 1925 (Guam).—Fowler: B. P. Bishop Mus., Bull. 38, p. 32, 1927 (Christmas Island).

Balistes (Pseudobalistes) flavimarginatus Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 298, 1868 (Waigiu).

Balistes flavomarginatus Waite: Australian Mus., Mem., no. 3, p. 197, 1897 (Funifuti, Ellice Islands).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 443, 1910 (South Sea).

Balistes brasiliensis Peters: Akad. Wiss. Berlin, Monatsb., p. 852, 1876 (1877) (New Britain).

Balistes papuensis Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 279, 1883 (type loc., Hood Bay, New Guinea).

Head 2 7/8; depth 1 7/8; D. III—26; A. 23; snout 1 1/5 in head; eye 7; maxillary 4; interorbital 3; gill-opening 2 1/3. Least depth of caudal peduncle 3 3/4 in head. Head width 2 in its length. Nine rows thorny points on scales of caudal peduncle and little forward. First dorsal spine 2 1/10 in head; fifth dorsal ray 2 1/10; fourth anal ray 2 1/10; caudal to ends of median rays 2 1/10; pectoral 2 1/4.

Color in alcohol slaty-brown, end of muzzle and abdomen whitish. Spinous dorsal with blackish membranes. Soft dorsal with deep brown, with dusky-neutral median obscure band, another submarginally and edge whitish. Anal similar. Caudal dusky basally, brown medianly with submarginal dusky line and edge behind whitish. Pectoral dusky-neutral basally, terminally whitish. Iris slaty. Teeth white.

In the Bishop Museum 1 from Nukuhiva 390 mm. One from Palmyra through M. Otani March 14, 1922, length 563 mm. The Agassiz Museum has 1 from the Society Islands about 228 mm. through Andrew Garrett, young from Fiji with scattered dark spots and 1 from Ebon Island, through Rev. B. G. Snow.

Balistes papuensis is evidently this species. It is described as follows: D. III—I, 26; A. 25; lateral line 26. No preocular groove. Patch of bony plates above gill opening. Body scales very warty and rough. Tail with 5 rows of minutely armed scales each side, longest row with 14 spines. Ventral spine movable. Soft dorsal, anal and caudal rounded. Greenish, with roundish dark spots scattered over sides of body. One or 2 darkish crossbars on soft dorsal and anal, 3 on caudal.

Red Sea, Mozambique, East Indies, Melanesia, Micronesia, Polynesia.

Balistapus aculeatus (Linné) (Pl. XLVI, *A*).

Balistes aculeatus Linné: Systema nat., 10th ed., p. 328, 1758 (type loc., India).—Lichtenstein: Descriptiones animalium, p. 156, 1844 (tropical Pacific Ocean).—Hollard: Ann. Sci. Nat. Zool., vol. 1, p. 333, 1854 (Polynesia).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 98, 1860 (New Guinea).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1850 (1860) (Doreh, New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 28, 1869 (Samoa; Viti Islands).—Günther: Cat. fishes Brit. Mus., vol. 8, p. 223, 1870 (Fiji; Micronesia).—Günther: Cruise of "Curaçoa" (Brenchley), p. 410, 1873 (Solomons).—Peters: Akad. Wiss. Berlin, Monatsb., p. 852, 1876 (1877) (Cartaret Harbor, New Ireland).—Streets: U. S. Nat. Mus., Bull., no. 7, pp. 79, 95, 1877 (Fanning Islands; Samoa).—Günther: Rept. voyage "Challenger," vol. 1, p. 36, 1880 (Kandavu, Fiji).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 595, 1882 (New Guinea).—Smith and Swain: U. S. Nat. Mus., Proc., p. 139, 1882 (Johnston Island).—Waite: Australian Mus., Mem., no. 3, p. 197, 1897 (Funafuti, Ellice Islands).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 374, 1897 (Rotuma).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 228, 1898 (Saypan, Mariannes).—Steindachner: Akad. Wiss. Wien, Denk., p. 517, 1901 (Laysan; Samoa).—Garman: Mus. Comp. Zool., Bull., vol. 39. p. 240, 1903 (Suva Reef, Fiji).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 443, 1910 (South Sea).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 18, p.

206, 1912 (Port Sandwich, New Hebrides).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 151 (Saonek, Waigiu).

Balistapus aculeatus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 496, 1899 (Thornton Island).—Fowler: op. cit., p. 528, 1900 (Samoa).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 115, 1900 (Agaña, Guam).—Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 135, 1902 (1903) (Marcus Island).—Snyder: U. S. Fish Comm., Bull., vol. 22, p. 534, 1902 (1904) (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 414, pl. 62, 1903 (1905) (Honolulu; Samoa).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 74, 1906 (Tahiti; Rarotonga; Faté; Raiatea; Nukuhiva).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 362, 1905 (1906) (Samoa).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 616, 1908 (Suva, Fiji).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 333. 1911 (Kusaie, Carolines; Rangiroa, Paumotus; Funafuti, Ellice Islands).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 85, Dec., 1922 (Hawaii).—Fowler: B. P. Bishop Mus. Bull. 22, pp. 20, 36, 1925, 1925 (Guam; Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 29, 1925 (Laysan, Johnston and Wake islands).—Fowler: op cit., Bull. 38, p. 32, 1927 (Palmyra, Fanning and Tongareva islands).

Balistes (Balistapus) aculeatus Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1413, 1906 (Upolu).

Balistes ornatissimus Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 119, pl. 10, fig. 1, 1830 (type loc., Baie de Beula, Borabora, Society Islands).

? Balistes heteracanthus Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. (3) 22, 1859 (type loc., Doreh, New Guinea).—Bleeker: Nat. Tijds. Ned. Ind., vol. 20, p. 93, 1859-60 (New Guinea).—Günther: Cat. fishes Brit. Mus., vol. 8, p. 211, 1870 (Doreh, New Guinea).

Balistes (Balistapus) heteracanthus Bleeker: Atlas ichth., vol. 5, p. 117, pl. (4) 218, fig. 1, 1865 (Doreh).

Monacanthus cheverti Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 355, pl. 17, fig. 3, 1877 (type loc., New Guinea).

Head 2 3/5 to 2 3/4; depth 2; D. III—1, 23 or 24; A. 1, 20 to 22; scales 40 or 41 to caudal base and 4 more on latter; 30 to 38 scales between spinous dorsal origin and pubic spine; 21 to 24 scales transversely between soft dorsal and anal origins; snout 1 1/10 to 1 2/5 in head; eye 3 1/2 to 6 1/8; interorbital 3 2/3 to 4; head width 1 3/4 to 1 4/5; pectoral fin 2 1/8 to 3. All show typical pattern of coloration, with slight variation.

In the Academy 2 from Samoa through H. C. Caldwell, 3 Apia and 2 Thornton Island. Largest 203 mm. The Bishop Museum has 10 from Honolulu, Palmyra Island 1 through C. Montague Cooke, Jr. in 1913 and 1 through Thurston and Thaanum in 1922, Marcus Island 1, Rarotonga 1, Agaña on Guam 4, Nukuhiva 3, Faté 6, Tahiti 2, Raiatea 2. Largest 282 mm. Also 3 from Laysan, 1 Johnston Island, and 3 Wake Island in 1923. In the National Museum 1 without locality, 1 Pacific Ocean ?, 1 Samoa and 2 Fiji, through the Wilkes Expedition. Other materials 2 from New Guinea, 2 Port Moresby, 7 Hawaiian Islands, 7 Fanning Islands of which 1 from Steinberger, 2 Johnston Island, 2 Tahiti through William Stimpson, 2 Kusaie, 6 Apia, 4 Rangiroa, 1 Ascension Island. The Agassiz Museum has 1 from Kingsmill Islands, 11 from Apiang through Andrew Garrett, 1 Kusaie, 2 Strong Island, Caroline Islands, through Rev. B. G. Snow and 27 from Ascension Island, latter through Rev. A. A. Sturges.

Balistes heteracanthus Bleeker, based on 3 young specimens 28 to 31 mm. long, seems to be the young of some species of *Balistapus*, probably *aculeatus*. It is said to have D. III—11, 23; A. 11, 20; lateral scales 40, transversely 25. Described by Jouan as *Balistes* No. 7, from Port de France, New Caledonia (Soc. Cherbourg, Mem., vol. 8, p. 246, 1861).

West Africa, Red Sea, Zanzibar, Mozambique, Mauritius, Seychelles, East Indies, Queensland, China, Melanesia, Micronesia, Polynesia, Hawaii.

Balistapus rectangulus (Schneider) (Pl. XLVI, *B*).

Balistes rectangulus Schneider: Systema ichth., Bloch, p. 462, 1801 (type loc., Indian Ocean) (on *Le Baliste echarpe* Lacépède: Hist. nat. Poiss., vol. 1, pp. 333, 352, pl. 16, fig. 1, 1799, type loc., Mauritius).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 39, 1874 (South Sea).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 595, 1882 (New Guinea).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 374, 1897 (Rotuma).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 228, 1898 (Saypan, Mariannes).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 517, 1901 (Honolulu). [Regan: Zool. Soc. London, Proc., pt. 1, p. 406, 1909 (Christmas Island, Indian Ocean).] Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 445, 1910 (Pelew Islands; Guam; Ponapé; New Hebrides; Maquesas; Samoa; Mortlock Island; Ruk; Marcus Island; Hawaiian islands).

Balistapus rectangulus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 514, 1900 (Hawaii).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 116, 1900 (Agaña, Guam).—Seale: op. cit., vol. 1, no. 5, pp. 19, 20, 1902 (Honolulu).—Bryan and Herre: op. cit., vol. 2, no. 1, p. 135, 1902 (1903 (Marcus Island).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 483, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 534, 1902 (1904) (Honolulu; Puako Bay).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 413, pl. 63, 1903 (1905) (Honolulu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 363, 1905 (1906) (Samoa).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 85, Dec., 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 20, 1925 (Guam).

Balistes (Balistapus) rectangulus Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1413, 1906 (Savaii).

Balistes medinilla Quoy and Gaimard: Voyage "Uranie," Zool., p. 206, pl. 46, fig. 2, 1824 (type loc., Iles des Papous).

Balistes erythropteron Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 123, pl. 10, fig. 3, 1830 (type loc., Borabora, Society Islands).

Balistes cinctus Hollard: Ann. Sci. Nat. Zool., vol. 1, p. 335, 1854 (Pacific Ocean).

Balistes (Balistapus) cinctus Bleeker: Atlas ichth., vol. 5, p. 119, pl. (14) 228, fig. 1, 1865 (Waigiu; New Guinea).

Balistes erythropterus Schmeltz: Mus. Godeffroy, Cat. 4, p. 28, 1869 (Samoa; Viti Islands).

Head 2 2/3; depth 2 1/8; D. III—11, 23; A. 11, 19; scales 45 to caudal base and 3 more on latter; 29

scales between rictus and gill opening; 43 scales between spinous dorsal origin and pubic spine; snout 1 1/4 in head; eye 6; interorbital 4; head width 2; 5 rows of antrorse spines along side of caudal peduncle. In alcohol faded pale brownish, though dark markings evident of darker brown. Blue and yellow lines faded whitish.

In the Academy 1 Hawaiian specimen 182 mm. long, obtained by J. K. Townsend. The Bishop Museum has 8 from Honolulu, 2 Faté and 4 Marcus Island. Largest 218 mm. The National Museum has 1 from the Tuamotus obtained by the Wilkes Expedition. Others through the Bureau of Fisheries comprise 6 Hawaiian and 2 Samoan specimens. The Agassiz Museum has 9 from Apiang through Andrew Garrett, 5 Honolulu also through Andrew Garrett, adult from Maui through C. F. Winslow, 1 Society Islands, 1 Marshall Islands, and 1 from Ascension Island, through Rev. A. A. Sturges.

The species is readily known by its striking coloration, a wide black band from the pectorals and gill opening to the anal base. Also black triangular blotch on caudal peduncle.

Red Sea, Zanzibar, Mozambique, India, East Indies, China, Japan, Melanesia, Micronesia, Polynesia, Hawaii.

Balistapus verrucosus (Linné).

Balistes verrucosus Linné: Systema nat., 10th ed., p. 328, 1758 (type loc., India).—Thiollière: Fauna Woodlark, p. 215, 1857 (Woodlark Island).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 98, 1860 (New Guinea).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (1860) (Doreh, New Guinea).—Günther: Cruise of "Curaçoa" (Brenchley), p. 410, 1873 (Solomons).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 39, 1874 (Pelew Islands).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 595, 1882 (New Guinea).—DeVis: Linn. Soc. New South Wales, Proc., vol. 8, p. 457, 1883 (Duke of York's Group).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 444, pl. 170, fig. A, 1910 (Pelew Islands; Solomons; Society Islands; New Britain; New Ireland; Huahine).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 151, 1913 (Saonek, Waigiu).

Balistes (Balistapus) verrucosus Bleeker: Atlas ichth., vol. 5, p. 120, pl. (2) 216, fig. 2, 1865 (Waigiu).—Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 298, 1868 (Waigiu).

Balistapus verrucosus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 74, 1906 (Shortland Island).

Balistes tamaked (Montrouzier) Thiollière: Fauna Woodlark, p. 215, 1857 (name in synonymy).

Head 2 2/5; depth 2 1/6; D. III-25; A. 22; scales 42 between gill opening and caudal base and 2 more on latter; head width 2 in its length; snout 1 1/5; eye 7 1/5; interorbital 5; gill opening 3 4/5; least depth of caudal peduncle 6 1/3; first dorsal spine 2 1/3; sixth dorsal ray 3 2/5; fifth anal ray 3 1/2; caudal 2 1/10; pectoral 3 1/10; 5 rows of thorns on caudal peduncle.

Dull brown on back, paler below. Four dark lines connect eyes across interorbital. Broad dusky-brown band from eye to gill opening, bordered in front and behind with pale line. Large dusky-brown blotch above vent. Under surface of body pale. Fins all pale, caudal little more brownish. Iris slaty.

Two from Shortland Island, 170 and 205 mm., in the Bishop Museum. In the National Museum 2 from Bougainville Island 115 and 150 mm. long.

Mauritius, India, East Indies, China, Melanesia, Micronesia, Polynesia.

Balistapus undulatus (Mungo Park).

Balistes undulatus Mungo Park: Linn. Soc. London, Trans., vol. 3, p. 37, 1797 (type loc., Sumatra).—Günther: Cat. fishes Brit. Mus., vol. 8, p. 226, 1870 (Louisiades).—Günther: Cruise of "Curaçoa" (Brenchley), p. 410, 1873 (Solomons).—Schmeltz: Mus. Godeffroy: Cat. 5, p. 39, 1874 (South Sea; Savay).—Peters: Akad. Wiss. Berlin, Monatsb., p. 852, 1876 (1877) (New Britain; New Hannover; New Ireland).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 595, 1882 (New Guinea).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 374, 1897 (Rotuma).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 115, 1900 (Guam).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 446, 1910 (South Sea).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 18, p. 206, 1912 (Port Sandwich, New Hebrides).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 151, 1913 (Saonek, Waigiu).

Balistapus undulatus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 496, 1899 (Thornton Island).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 74, 1906 (Papeete; Faté; Shortland Island; Raiatea).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 363, 1905 (1906) (Apia).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 356, 1906 (Tahiti).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 333, 1911 (Jaluit and Arhno, Marshalls; Suva, Fiji).—Fowler: B. P. Bishop Mus., Bull. 22, p. 36, 1925 (Samoa).—Fowler: B. P. Bishop Mus., Bull. 38, p. 32, 1927 (Malden Island).

Balistes (Balistapus) undulatus Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1413, 1906 (Upolu).

Balistes praslinensis Quoy and Gaimard: Voyage "Uranie," Zool., p. 205, pl. 46, fig. 1, 1824 (type loc., Praslin Island; Waigiu).

Balistes praslensis Hollard: Ann. Sci. Nat. Zool., vol. 1, p. 332, 1854 (Polynesia).

Balistes lamourouxii Quoy and Gaimard: Voyage "Uranie," Zool., p. 208, pl. 47, fig. 1, 1824 (type loc., Carolines).

Balistes praslinoides Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 117, pl. 9, fig. 3, 1831 (type loc., Port Praslin, New Ireland).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 28, 1869 (Pelew Islands).

Balistes sesquilineatus Lay and Bennett: Zool. Beechey's voyage, p. 69, pl. 21, fig. 3, 1839 (type loc., Tahiti).

Balistes oire Bennett: Narrative whaling voyage, vol. 2, p. 262, 1840 (type loc., Raiatea; Tahiti).

Balistes lineatus Thiollière: Fauna Woodlark, p. 217. 1857 (Woodlark Island).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 98, 1860 (New Guinea).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, pp. 3, 5, 1859 (1860) (Doreh, New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 28, 1869 (Samoa; Viti Islands; Savay).

Balistes (Balistapus) lineatus Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 298, 1868 (Waigiu).

Balistapus lineatus Fowler: B. P. Bishop Mus., Bull. 22, p. 20, 1925 (Guam).

Balistes kib (Montrouzier) Thiollière: Fauna Woodlark, p. 217, 1857 (name in synonymy).

Head 2 2/3 to 3; depth 1 4/5 to 1 5/6; D. III-1, 24 to 26; A. 1, 22 or 23; P. 1, 12; scales 46 to 50 from gill opening to caudal base and 2 or 3 more on latter; 30 to 34 scales between rictus and gill opening; 38 to 42 scales between spinous dorsal origin and pubic spine; 2 rows of strong antrorse spines on caudal peduncle,

sometimes another spine above; snout 1 1/4 to 1 1/3 in head; eye 5 to 6 1/3; interorbital 4 to 4 3/4; head width 1 3/4 to 2.

Body nearly fuscous, with many slaty-gray lines obliquely backward, closer or more crowded on head above; lowest forks to embrace snout edge and lower lip, and below fork extends over chin. Fins all pale brown, except dusky spinous dorsal, and bases dark, at least of each ray. Caudal peduncle in large slaty-dusky blotch, twice size of eye.

In the Academy 2 from Thornton Island (dry skins) and 6 from Apia. Length 97 to 198 mm. The Bishop Museum has 2 from Shortland Island, 3 Faté, 2 Raiatea, 2 Tahiti and 2 from Agaña on Guam. Length 226 mm. The National Museum has 5 from Samoa, 4 Tahiti, 1 Suva, 1 Admiralty Islands, and 1 Jaluit. The Agassiz Museum has 8 from Apiang through Andrew Garrett, 12 from the Society Islands through the same donor; in the Marshalls 16 from Ascension Island through Rev. A. A. Sturges, and 13 from Ebon Island through Rev. B. G. Snow; 2 from Ponapé through Rev. L. H. Gulich, 4 Apia and 1 Jaluit. Largest 254 mm.

Red Sea, Zanzibar, Mozambique, East Indies, Philippine Islands, China, Japan, Melanesia, Micronesia, Polynesia.

Melichthys buniva (Lacépède) (Pl. XLVI, *C*).

Balistes buniva Lacépède: Hist. nat. Poiss., vol. 5, pp. 668, 669, pl. 21, fig. 1, 1803 (type loc., "Museum de Turin").—Günther: Cat. fishes Brit. Mus., vol. 8, p. 227, 1870 (Hawaii).—Streets: U. S. Nat. Mus., Bull., no. 7, p. 56, 1877 (Honolulu).—Günther: Rept. voyage "Challenger," vol. 1, p. 62, 1880 (Honolulu).—Smith and Swain: U. S. Nat. Mus., Proc., vol. 5, p. 140, 1882 (Johnston Island).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 17, 20, 1902 (Honolulu).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 446, 1910 (type; Hawaiian islands).

Balistes (Melanichthys) buniva Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 517, 1901 (Honolulu; Laysan).

Melichthys buniva Fowler: B. P. Bishop Mus., Bull. 22, p. 30, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 30, 1925 (French Frigates Shoal, Gardner, Necker, Johnston, Wake and Laysan islands).

Balistes kibitar Thiollière: Fauna Woodlark, p. 216, 1857 (type loc., Woodlark Island).

Melichthys piceus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 496, 1899 (Thornton Island).

Balistes fuscolineatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 4, p. 9, fig. 4, 1901 (type loc., Honolulu).—Seale: op. cit., vol. 1, no. 5, p. 21, 1902 (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 409, 1903 (1905) (Honolulu).

Balistes (Parabalistes) ringens Steindachner: Akad Wiss. Wien, Denk., vol. 70, p. 517, 1901 (Laysan).

Melichthys bispinosus Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 135, 1902 (1903) (Marcus Island).

Melichthys radula Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 483, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 534, 1902 (1904) (Honolulu; Puako Bay; south of Molokai; 8 to 222 fathoms).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 417, pl. 64. 1903 (1905) (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 85, Dec., 1922 (Hawaii).

Head 3 1/4 to 3 1/2; depth 2 to 2 1/5; D. III-1, 31 or 32; A. 1, 28 or 29; scales 60 to 62 between head and caudal base and 5 or 6 more on latter; 24 scales between rictus and gill opening; 47 or 48 scales from spinous dorsal origin to pubic bone; snout 1 1/3 to 1 2/5 in head; eye 4 1/4 to 5 1/5; interorbital 2 4/5 to 2 7/8; head width 1 3/4 to 1 7/8; 8 to 11 horizontal keels along hind part of trunk, most of median extending on caudal peduncle.

Largely uniform blackish, with white basal line to soft dorsal and anal. In smallest example this widest behind. Most also show number of close-set slaty lines on head, transversely across interorbital and snout, and those behind and below within junctures of scales.

In the Academy 3 from Thornton Island, 190 to 280 mm., dried skins. The National Museum has 2 from Tuamotus, 173 to 235 mm. obtained by the Wilkes Expedition. Also 7 Hawaiian specimens through the Bureau of Fisheries and 1 from T. H. Streets, 1 Johnston Island, 1 Marshall Islands. The Bishop Museum has 8 from Honolulu, 2 Marcus Island, and 2 types of *Balistes fuscolineatus*. Largest 316 mm. One of the Honolulu specimens with deformed head, with deep indenture just before eyes. I examined 79 specimens in the Honolulu markets in November and December 1922 and January 1923. Also 3 from French Frigates Shoal, 1 Gardner Island, 1 Necker Island, 3 Johnston Island, 2 Wake Island, and 7 from Laysan in 1923. One Hawaiian specimen in the Agassiz Museum.

Apparently this species is described by Jouan as *Balistes* (Soc. Cherbourg, Mem., 9, 1863, p. 104) on a specimen over 200 mm. from New Caledonia.

Dusky-black generally and the fins darker than the body. Along side of tail 8 rows of spines. A pale line around lips but none noticed along soft dorsal and anal bases.

Zanzibar, East Indies, China, Melanesia, Micronesia, Polynesia, Hawaii.

Odonus erythrodon (Günther).

Balistes erythrodon Günther: Cat. fishes Brit. Mus., vol. 8, p. 228, 1870 (type loc., Zanzibar; Mauritius; Ceram).—Günther: Cruise of "Curaçoa" (Brenchley), p. 410, 1873 (Solomons).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 447, 1910 (Solomons; Society Islands; Raiatea).

Odonus erythrodon Fowler: B. P. Bishop Mus., Bull. 30, p. 32, 1927 (Christmas and Fanning islands).

Balistes niger (non Bloch 1786) Hollard: Ann. Sci. Nat. Zool., vol. 1, p. 315, 1854 (East Indies; Pacific Ocean).

Head 3 1/3; depth 2; D. III-1, 32; A. 1, 29; scales 30 between gill opening and caudal base and 3 more on latter; 17 transversely between spinous dorsal origin and anal origin; snout 1 2/5 in head measured from its own tip; eye 5; mouth width 4 4/5; interorbital 2 7/8.

Body deeply ovate, compressed. Caudal peduncle compressed, least depth 1 1/2 in its length or 4 1/2 in total head length.

Head width 2 in its length. Snout long, width at front of eyes 1 9/10 in its length. Eye elevated, center near

last fourth in head measured from snout tip; diameter 3 3/4 in snout, 1 3/4 in interorbital; preocular groove forward and downward, little over eye diameter. Mouth small, lower jaw protruded. Teeth protruding, single conic one each side above largest. Nostrils small, close together, front one 3/4 an eye diameter before eye. Interorbital convex. Gill opening 3 3/4 in total head length, with 4 bony tubercles posterior.

Scales on hind half of tail with 7 horizontal rows of low obsolete tubercles, each with slight spine and 1 to a scale. First dorsal spine with front edge asperous, 2 in head; first branched dorsal ray 1 1/4; first branched anal ray 2; caudal with median rays short, 2 1/4; pectoral 2 3/4; ventral spine 4 2/5.

Uniform chocolate-brown. Caudal with hind edge narrowly whitish and with submarginal pale brown line, also blue-gray one. Length 326 mm.

In the Agassiz Museum 1 from the Society Islands, obtained by Andrew Garrett. The Bishop Museum has 1 from Christmas Island 305 mm. and 1 from Fanning Island 333 mm.

Zenodon caeruleolorum Fowler (Acad. Nat. Sci. Philadelphia, Jour., 2nd ser., vol. 12, p. 546, pl. 18, upper figure, 1904, type loc., Padang, Sumatra) is a synonym, simply a color variant.

Red Sea, Mombasa, Zanzibar, Reunion, East Indies, Melanesia, Polynesia.

MONACANTHIDAE

Monacanthus chinensis (Osbeck).

Balistes chinensis Osbeck: Reis. Ost. Ind. China, p. 147, 1765 (type loc., China).

Monacanthus chinensis Schmeltz: Mus. Godeffroy, Cat. 4, p. 28, 1869 (Upolu).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 151, 1913 (Sorong, New Guinea)

Known by the broad ventral flap or dewlap, projecting well below the abdomen fan-like or fin-like. Reaches 288 mm.

East Indies, China, Australia, Polynesia.

Monacanthus cirrhifer Schlegel.

Monacanthus cirrhifer Schlegel: Fauna Japonica, Poiss., pt. 15, p. 290, pl. 130, fig. 1, 1850 (type loc., Japan).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 164, 1912 (Cook Bay, Easter Island).

Head 3; depth 1 3/4; D. I-35; A. 32; snout 1 1/6 in head; orbit 4 3/5; dorsal spine 2 1/3 and reaches half way from its base to soft dorsal. Dark brown, with very faint traces of crossbars. Broad bars across chin, throat and snout. Dorsal spine banded. Soft dorsal and anal yellowish. Caudal darker than body. Length 168 mm. (Kendall and Radcliffe)

One in the National Museum from Cook Bay on Easter Island.

Monacanthus filicauda Günther.

Monacanthus filicauda Günther: Rept. voyage "Challenger," vol. 1, p. 50, pl. 23, fig. D, 1880 (type loc., south of New Guinea, S. Lat. 9° 59′ E. Long. 139° 42′ in 28 fathoms).

Head 3; depth at vent 2; D. I-35; A. 37; snout 1 1/2 in head; eye 2 in snout, 2 4/5 in head. Snout moderately produced, upper profile very slightly concave. Scales minute, entire surface uniformly covered with asperities longitudinally arranged. Dorsal spine rather slender, longer than snout, granular in front, armed with double series of barbs behind; placed above hind edge of orbit. Caudal obliquely truncated with upper ray prolonged into filament. Ventral spine movable, small. Light brownish, with more or less conspicuous darker spots. Round black spot immediately below front third of dorsal fin constant. Length 127 mm. (Günther)

Monacanthus nematophorus Günther.

Monacanthus nematophorus Günther: Cat. fishes Brit. Mus., vol. 8, p. 241, 1870 (type loc., China or Borneo).—Weber: Siboga Exped., vol. 65, p. 578, 1913 (near New Guinea, S. Lat. 1° 42.5′ E. Long. 130° 47.5′ in 32 m.).

Depth not quite 2; D. 25; A. 25. Snout moderately produced, upper profile scarcely concave. Skin velvety, with scattered, long, fringed filaments. Dorsal profile between fins nearly horizontal. Dorsal spine above hind eye edge, strong, rather shorter than head, armed with double series of barbs behind. Dorsal and anal fins rather low. Caudal rounded. Ventral spine movable, spiny, free from ventral flap. Uniform brownish. Length 45 mm. (Günther)

East Indies, China.

Monacanthus melanocephalus Bleeker.

Monacanthus melanocephalus Bleeker: Nat. Tijds. Ned. Ind., vol. 5, p. 95, 1853 (type loc., Lawajong, Solor).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 28, 1869 (Upolu).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 279, 1883 (Engineer Group, New Guinea).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 374, 1897 (Rotuma).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 365, fig. 69, 1905 (1906) (Apia; Pago Pago).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 450, 1910 (Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 30, 1925 (Johnston Island).

Monacanthus nitens Hollard: Ann. Sci. Nat. Zool., vol. 2, p. 364, pl. 14, fig. 4, 1854 (type loc., Tongatabu).

Head 2 4/5 to 3 1/6; depth 1 9/10 to 2; D. I-31 to 33; A. 28 to 30; snout 1 1/4 to 1 1/3 in head measured from upper jaw tip; eye 3 to 4; interorbital 3 1/4 to 3 1/2.

Body strongly compressed, deeply ovoid. Caudal peduncle entirely and adjacent region in front finely villose; least depth 1 3/4 to 2 1/5 in total head length. Head width 2 1/5 to 2 1/4 its length. Snout with upper profile concave, width 2 3/4 to 3 in its length. Eye with posterior half above gill opening, 2 2/3 to 3 1/8 in snout, 1 1/8 to 1 1/5 in interorbital. Mouth small, with short gape, lower jaw little protruded. Lips moderate, smooth. Teeth notched, anterior lower broadest. Nostrils together, anterior 2/3 an eye diameter before eye. Interorbital convexly elevated. Gill opening before and above pectoral, slightly less than eye. Skin finely rough velvety, becoming more or less villose on tail. Dorsal spine above eye, 1 to 1 1/5 in head, each side with 6 to 13 antrose denticles. Pubic process spinescent, nearly as 3 clusters of denticles diverging each side, followed by low finely spinescent pubic flap. Third dorsal ray 2 1/2 in head; fifth anal ray 2 1/2 to 2 3/5; caudal 1 3/4 to 1 7/8, rounded convexly behind; pectoral 2 1/8 to 2 1/4.

Blackish-brown generally. Pubic flap black, with submarginal row of minute pale blue dots. Denticles on dorsal spine white, spine blackish. Soft dorsal and anal dull brown, with 9 or 10 waved blackish lines. Caudal pale yellowish, with hind edge blackish. Length 75 to 122 mm.

Four in the Bishop Museum from Johnston Island in 1923. In the National Museum 1 without locality, probably Polynesia ?, collected by the Wilkes Expedition. Also 4 from Samoa through the Bureau of Fisheries.

East Indies, Melanesia, Polynesia.

Monacanthus tomentosus (Linné).

Balistes tomentosus Linné: Systema nat., 10th ed., p. 328, 1758 (type loc., America).

Monacanthus tomentosus Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 298, 1868 (Waigiu).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 28, 1869 (Kandavu).—Schmeltz: op. cit., Cat. 5, p. 39, 1874 (Pelew Islands; Kanathia).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 151, 1913 (Majalibit Bay, Waigiu; Sorong, New Guinea).

? Monacanthus beibar Thiollière: Fauna Woodlark, p. 214, 1857 (type loc., Woodlark Island).

Monacanthus hajam Bleeker: Atlas ichth., vol. 5, p. 126, pl. (16) 230, figs. 1-3, 1865 (New Guinea).

Monacanthus hyam Schmeltz: Mus. Godeffroy, Cat. 4, p. 28, 1869 (Pelew Islands).

Depth 2 to 2 1/2; D. 27 to 29; A. 25 to 27. Snout pointed, upper profile concave. Scales exceedingly small, each with 4 or 5 spines on margin. Each side of tail oblong patch of short, setiform spines, well developed in adult males, very small or entirely absent in females and young. Body sometimes with scattered short filaments. Dorsal spine very strong, long as head, armed behind with double series of strong, recurved spines, placed above eye and nearer posterior than anterior edge. Dorsal and anal fins low. Caudal rounded. Ventral spine movable, with curved spinelets on side, separated from ventral rays. Brown, marbled with blackish. Indistinct whitish longitudinal band on side of trunk behind gill opening. Caudal with 2 blackish crossbands. Length 128 mm. (Günther)

The imperfectly noticed *Monacanthus beibar* Thiollière may be the young: Upper profile not concave above mouth, nearly straight to dorsal spine. Skin rough to touch. No spine on side of tail. Dorsal spine inserted behind eye, not over eye. Dorsal and anal not rounded but angular in front. Caudal not rounded behind but cut in pointed arch or in lancet. Brown, with golden-brown tints. Length 51 mm.

East Indies, China, Queensland, Micronesia, Polynesia.

Monacanthus spilosoma Lay and Bennett (Pl. XLVIII, *A*).

Monacanthus spilosoma Lay and Bennett: Zool. Beechey's voyage, p. 70, pl. 22, fig. 1, 1839 (type loc., Oahu).—Günther: Cat. fishes Brit. Mus., vol. 8, p. 243, 1870 (Hawaiian islands).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 514, 1900 (Hawaiian islands).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 517, 1901 (Laysan).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 451, 1910 (Hawaiian islands).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).

Monacanthus spilosomus Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 86, Dec., 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 30, 1925 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 30, 1925 (Necker Island).

Stephanolepis spilosomus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 484, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 534, 1902 (1904) (Honolulu; Niihau; Necker Island; Bird Island; 18 to 33 fathoms).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 944, 1904 (Laysan).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 420, pl. 65, 1903 (1905) (Hilo; Honolulu).

Stephanolepis pricei Snyder: U. S. Fish Comm., Bull., vol. 22, p. 534, pl. 12, fig. 22, 1902 (1904) (type loc., near Kauai, 289 to 399 fathoms).

Head 3 1/4 to 3 2/5; depth 2 to 2 1/4; D. I-38; A. 35 or 36; snout 1 1/5 to 1 1/4 in head from snout tip; eye 4 to 4 3/4; dorsal spine 1 1/4 to 1 1/3; pectoral fin 2 1/5 to 2 1/3. Dorsal spine finely rough in front and 8 lateral spines directed downwards. Body quite finely rough, asperities becoming larger and more bristle like on caudal peduncle and caudal base. Movable pubic spine with terminal cluster of 6 radiating denticles and 2 or 3 more each side basally.

Dark brown, with oblique dark lines on side of head. Rest of trunk thickly spotted with dusky. Dorsal and anal pale, with numerous parallel fine brown lines longitudinally. Caudal with narrow whitish edge and broad blackish submarginal band.

In the Academy 1 Hawaiian specimen 128 mm. through J. K. Townsend. The Bishop Museum has 13 from Honolulu, 68 to 161 mm. Also 1 from Kahalue on Maui and 1 from Honomuni on Molokai through W. A. Bryan in July 1914. I found 1 in the Honolulu market December 28, 1922. One from Necker Island in 1923. The National Museum has 3 Hawaiian specimens obtained by the Wilkes Expedition. Through the Bureau of Fisheries 7 Hawaiian specimens, 4 Honolulu, 1 Laysan, and type of *Stephanolepis pricei*. The Agassiz Museum has 13 Hawaiian specimens through Andrew Garrett and 1 from Maui through C. F. Winslow.

Chaetodermis spinosissimus (Quoy and Gaimard).

Balistes spinosissimus Quoy and Gaimard: Voyage "Uranie," Zool., p. 211, pl. 45, figs. 3-8, Oct. 9, 1924 (type loc., "les baie des Chiens-Marins, à la Nouvelle-Hollande").

Monacanthus pencilligerus (Peron) Cuvier: Regne animal, 2nd ed., vol. 2, p. 374, 1829 (on Quoy and Gaimard's plate).—Günther: Rept. voyage "Challenger," vol. 1, p. 50, 1880 (Arafura Sea, S. Lat. 9° 59′ E. Long. 139° 42′ in 28 fathoms).

Depth 1 1/6 to 1 1/2; D. 26; A. 24. Upper profile of snout straight or but little concave. Body covered with compressed, 3-rooted spines, forming regular longitudinal series. Fringed fleshy filaments on dorsal and ventral spines, head and body. Dorsal spine moderate, spinelets irregularly arranged, inserted immediately behind orbit. Soft dorsal origin level with or but little raised above base of dorsal spine. Caudal more or less elongate, especially with age. Ventral spine fixed, spiny, projects beyond ventral flap. Brownish, irregularly marked darker. Round black spot in middle of side. Some straight black lines along body and tail. Vertical fins with numerous black dots. Length 254 mm. (Günther)

East Indies, Australia.

Cantherines sandwichiensis (Quoy and Gaimard) (Pl. XLVII, *A*).

Balistes sandwichiensis Quoy and Gaimard: Voyage "Uranie," Zool., p. 214, 1824 (type loc., Hawaii [understood]).

Cantherines sandwichiensis Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 514, 1900 (Hawaiian islands).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 484. 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 534, 1902 (1904) (Honolulu; Puako Bay).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 944, 1904 (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 418, fig. 183, 1903 (1905)

(Hilo; Honolulu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 364, 1905 (1906) (Apia; Pago Pago).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 86, Dec., 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 30, 1925 (Honolulu).

Amanses sandwichensis Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 116, 1900 (1901) (Guam).

Monacanthus (Cantherines) sandwichiensis Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 11, p. 1413, 1906 (Savaii).

Monacanthus sandwichiensis Fowler and Ball: B. P. Bishop Mus., Bull. 25, p. 30, 1925 (Johnston Island).

Cantherines nasutus Swainson: Nat. Hist. An., vol. 2, p. 327, 1839 (on *Balistes sandwichiensis* Quoy and Gaimard).

Monacanthus fuliginosus Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 596, 1882 (type loc., New Guinea).

Pseudomonacanthus punctulatus Regan: Zool. Soc. London, Proc., vol. 2, p. 298, pl. 25, fig. 2, 1902 (type loc., Tahiti).

Monacanthus carolae Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 449, 1910 (Tahiti; Aneiteum; Marquesas; Hawaiian islands).

Head 3; depth 1 3/4; D. I-36; A. 31; snout 1 1/5 in head; eye 4; interorbital 3 1/2; head width 2 1/4; dorsal spine 1 2/5, rough in front. Sides below with few small spines each side. Pubic spine immovable. Nearly uniform Saccord's umber, soft dorsal and anal pale. Teeth brown.

In the Academy 1 Hawaiian specimen 113 mm. long through J. K. Townsend. The Bishop Museum has 8 from Honolulu and 1 from Guam. Largest 367 mm. I found 27 in the Honolulu market in December 1922. One from Johnston Island in 1923. The National Museum has 1 from Tahiti collected by the Wilkes Expedition.

Monacanthus fuliginosus is described: Depth 2 in total; D. 34; A. 32. Snout rather long, profile very slightly concave. Skin like fine sandpaper. Dorsal spine long, pointed, covered with granulations, rising above front eye edge. Tail truncate. Ventral spine not extending beyond ventral flap. Uniform sooty-brown, fins clear.

Mauritius, East Indies, Melanesia, Micronesia, Polynesia, Hawaii.

Cantherines pardalis (Rüppell) (Pl. XLVII, *B*).

Monacanthus pardalis Rüppell: Neue Wirbelth., Fische, p. 57, pl. 15, fig. 3, 1835 (type loc., Tor, northeast Red Sea).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 98, 1860 (New Guinea).—Günther: Cruise of "Curaçoa" (Brenchley), p. 410, 1873 (Solomons).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 39, 1874 (South Sea).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 517, 1901 (Honolulu).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 448, pl. 169, fig. B, 1910 (Society Islands).

Liomonacanthus pardalis Bleeker: Atlas ichth., vol. 5, p. 136, pl. (16) 230, fig. 2, 1865 (New Guinea).

Cantherines pardalis Fowler: B. P. Bishop Mus., Bull. 22, p. 20, 1925 (Guam).

Monacanthus kibikib Thiollière: Fauna Woodlark. p. 213, 1857 (type loc., Woodlark Island).

Monacanthus ruppelli Schmeltz: Mus. Godeffroy, Cat. 4, p. 28, 1869 (Viti Islands).

Amanses sandwichensis (non Quoy and Gaimard) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 116, 1900 (Guam; part).

Monacanthus fatensis Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 74, fig. 13, 1906 (type loc., Faté, New Hebrides [No. 997]).

Monacanthus spilosomus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 75, 1906 (Rarotonga).

Head 3; depth 1 3/4; D. II-34; A. 29; snout 1 1/6 in head; eye 3 1/2; interorbital 3 1/2.

Body well compressed, deepest at ventral spine, which with 4 or 5 strong spines each side; ventral flap moderate, not extending beyond spine. Caudal peduncle strongly compressed, length 3/4 its least depth, which 2 3/5 in head.

Head width 2 1/6 in its length. Snout compressed, upper profile slightly concave, width at front of eyes 3 1/4 in its length. Eye well elevated over gill opening; diameter 3 2/5 in snout, slightly less than interorbital. Mouth small, lower jaw well protruded. Teeth 6 in each jaw, their edges deeply notched. Nostrils small, close together, front one 2/5 an eye diameter before eye. Interorbital convexly elevated. Gill opening slightly greater than eye.

Skin all finely or evenly rough, no spines on caudal peduncle. Dorsal spine 1 1/10 in head, front edge and lower lateral edges finely, thickly and evenly with minute denticles; eighth ray 3 2/3; eighth anal ray 2 2/5; caudal 1 3/5, rounded convexly behind; pectoral 2 1/4.

Largely dull hair brown, mostly uniform. Head with number of pale, parallel, grayish lines, all converging to muzzle. Iris gray-brown. At bases of last dorsal and anal rays round whitish spot about size of pupil. Trunk with traces of grayish reticulated lines. Along soft dorsal base 2 dark or dusky blotches and same along anal base. Caudal brownish, with obsolete, subbasal dark band and another along outer edge; upper and lower rays each with transverse grayish lines. Length 110 mm.

In the Agassiz Museum 1 from Ascension Island, obtained by Rev. A. A. Sturges in 1877. It agrees closely with Bleeker's figure of *Liomonacanthus pardalis*, except he does not show the dark blotch at the soft dorsal and anal bases, a white blotch on caudal peduncle behind last anal ray or pale lines on uppermost and lowermost caudal rays. Also 2 from Maui through C. F. Winslow. The Bishop Museum has 14 from Honolulu, 3 from Guam, 1 Rarotonga, and type of *Monacanthus fatensis*. One 184 mm.

Red Sea, Zanzibar, Cape of Good Hope, East Indies, Melanesia, Micronesia, Polynesia.

Cantherines howensis (Ogilby).

Monacanthus howensis Ogilby: Australian Mus., Mem., no. 2, p. 73, 1889 (type loc., Lord Howe Island).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 449, 1910 (Society Islands; Honolulu; type of *Pseudomonacanthus multimaculatus* Regan).

Monacanthus albopunctatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 4, p. 13, fig. 6, 1901 (type loc., Honolulu).

Pseudomonacanthus multimaculatus Regan: Zool. Soc. London, Proc., vol. 2, p. 298, pl. 25, fig. 1, 1902 (type loc., Tahiti).

Head 3; depth 1 3/4; D. II-38; A. 33; snout 1 1/5 in head; eye 5 1/8; interorbital 3 1/8; gill opening 3. Least depth of caudal peduncle 2 1/4 in head. Head

width 2 2/5 in its length. Teeth 6 in each jaw, broad, edges of upper somewhat emarginate, lower broadly and shallowly so. Skin rough velvety. Two pairs of small close-set thorns on each side of caudal peduncle. First dorsal spine (broken) 1 2/5 in head; eighth dorsal ray 2 7/8; eighth anal ray 3 1/10; caudal convex behind, 1 7/8; pectoral 2 7/8; ventral spine immovable, rough, with large denticles.

Color in alcohol largely dull brownish. Lips edged with dark brown. Iris slaty. Soft dorsal and anal pale brown. Three broad blotches of dusky-brown on basal half of each fin. Caudal dusky-brown, hind edge narrowly whitish and 3 obscure blackish transverse bands. Pectoral brown like body. Ventral flap dusky.

The Bishop Museum has the type of *Monacanthus albopunctatus,* 172 mm. long, noted above. In the Agassiz Museum 3 from the Society Islands, largest 317 mm.

Lord Howe Island, Polynesia, Hawaii.

Cantherines macrurus (Bleeker).

Monacanthus macrurus Bleeker: Nat. Tijds. Ned. Ind., vol. 12, p. 226, 1856-57 (type loc., Nias).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 46, 1885 (Rubi, New Guinea).

D. 31; A. 29. Body with small, spiny, very distinct scales and scattered cutaneous filaments. Adults with large, simple, hooked spines each side of tail below. Depth little less than 2. Upper profile of snout concave. Gill opening partly before front eye edge. Pectoral below middle of eye. Dorsal spine above middle of eye, much shorter than head, in front with double row of barbs close set and smaller than those behind. Caudal long as head. Olive, clouded brown. Head, body and caudal with numerous brown dots. Length 177 mm. (Günther)

East Indies.

Paramonacanthus garretti new species (fig. 78).

Head 3; depth 2 1/8; D. II-34; A. 32; snout 1 1/3 in head measured from upper jaw tip; eye 3; interorbital 3 1/2.

Body well compressed, slender. Caudal peduncle well compressed, least depth 1 2/5 in its length or 3 2/3 in total head length. Ventral spine with immovable process, half length of eye and with 3 spines each side.

Head width 2 2/5 in its length. Snout compressed, upper profile little convex, width 3 1/4 in its length. Eye large, high, diameter 2 1/4 in snout or little greater than interorbital. Mouth small, lower jaw well protruded. Teeth 6 in each jaw, edges notched. Nostrils small, close together, front one little less than half of eye diameter before eye. Interorbital broadly convex. Gill opening oblique, below anterior half of eye; about long as eye.

Skin finely asperous. Dorsal spine 1 1/3 in head, with front row of antrorse serrae and row each side; seventh dorsal ray 2 1/2; seventh anal ray 2 1/4; caudal 1 2/5, rounded behind; pectoral 2 3/4.

Pale brown generally. Soft dorsal and anal pale. Caudal brown. Traces of few dark longitudinal lines along abdomen above ventral flap and parallel with its lower edges. Also some traces of obsolete darker spots along flanks. Length 94 mm.

Type, No. 11808, M. C. Z. Hawaiian islands. Andrew Garrett. It differs from *Paramonacanthus curtorhynchus* Bleeker in the greater number of rays, that species alleged to have dorsal 28 and anal 27. It does not show the 2 dark transverse bands on the caudal as Bleeker indicates. His figure also shows the gill opening opposite the posterior half of the eye.

(Named for Andrew Garrett, who collected the type.)

Amanses scopas (Cuvier).

Acanthurus scopas Cuvier: Regne animal, vol. 2, p. 224, 1829 (on Renard: Poiss. Moluques, vol. 1, pl. 40, fig. 210, 1718).

Amanses scopas Kner and Steindachner: Akad. Wiss. Wien, Sitz., vol. 54, pt. 1, p. 390, 1866 (Samoa).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 28, 1869 (Upolu).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 365, fig. 68, 1905 (1906) (Apia).

Monacanthus scopas Schmeltz: Mus. Godeffroy, Cat. 5, p. 39, 1874 (Samoa).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 596, 1882 (New Guinea).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 374, 1897 (Rotuma).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, pt. 450, 1910 (Society Islands; Samoa; New Britain; Ponapé; Rotuma).

FIGURE 78.—Drawing of *Paramonacanthus garretti.*

Monacanthus nigricans Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 596, 1882 (type loc., New Guinea).

Head 3 1/6; depth 1 3/4; D. I-29; A. 25; snout 1 1/8 in head; eye 3 3/4; interorbital 2 2/3.

U. S. Nat. Mus., Bull., no. 7, p. 78, 1877 (Fanning Islands).

Ostracion tuberculatum Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 77, 1906 (Raiatea; Rarotonga; Nukuhiva).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 367, 1905 (1906) (Apia; Pago Pago).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 356, 1906 (Tahiti).—Kendall and Radcliffe: Mus. Comp. Zool., Mem., vol. 35, p. 165, 1912 (Mangareva, Gambier Islands).

Ostracion chryseres Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 75, fig. 20, 1906 (type loc., Tubuai, Austral Islands).

Ostracion auricauda Seale: B. P. Bishop Mus., vol. 4, no. 1, p. 77, fig. 21, 1906 (type loc., Mangareva, Gambier Islands).

Head 3 3/4 to 4 2/5; depth 2 3/4 to 3; D. 1, 8; A. 1, 8; snout 1 1/4 to 1 1/3 in head; eye 3 1/2 to 4 2/3; interorbital 1 1/5 to 1 1/3. Head 1 1/6 in its length. Least depth of caudal peduncle 2 1/5 in head. Upper profile of snout concave. Interorbital broadly convex. Carapace with 4 rather blunt ridges, spineless, forming wide bony ridge across back of tail. Back broadly convex, belly broadly depressed or concave. Color in alcohol dull uniform brown. Sometimes small dark spots on head, belly, caudal peduncle and fin bases.

The Bishop Museum has the types of *Ostracion auricauda* and *Ostracion chryseres,* 1 from Honolulu, 1 Rarotonga, 2 Nukuhiva, 2 Raiatea, and 1 Guam. Largest 386 mm. Günther thought *Ostracion chryseres* Seale may be Hollard's *Ostracion ornatus,* but quotes from Hollard that "a more or less pointed protuberance in front of the dorsal fin, from which several raised lines radiate" occurs. There is certainly nothing like this, or more developed than in any of the other specimens before me. The National Museum has 2 from New Guinea, 3 Samoa, and 1 Mangareva. In the Agassiz Museum 5 from the Society Islands through Andrew Garrett; 4 Apiang in the Kingsmill Islands also from Andrew Garrett; 8 from Ebon Island through Rev. B. G. Snow and 1 from Ascension Island, through Rev. A. A. Sturges; 1 Mangareva; 2 Kusaie in the Caroline Islands, through Rev. B. G. Snow.

Red Sea, Zanzibar, Mozambique, Mauritius, Seychelles, Ceylon, East Indies, Queensland, Japan, Melanesia, Micronesia, Polynesia, Hawaii.

Ostracion sebae Bleeker.

Ostracium sebae Bleeker: Nat. Tijds. Ned. Ind., vol. 2, p. 259, 1851 (type loc., Banda, Neira).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 28, 1869 (Samoa).

Ostracion sebae Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 39, 1874 (Samoa; Tahiti).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 279, 1883 (Engineer Group, New Guinea).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 228, 1898 (Saypan, Mariannes).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 496, 1900 (Thornton Island).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 28, p. 125, 1904 (Honolulu; Samoa).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 442, fig. 195, 1903 (1905) (Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 77, 1906 (Faté; Rarotonga; Tahiti).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 367, 1905 (1906) (Apia).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 89, Dec., 1922 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 21, 1925 (Guam).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 30, 1925 (Wake, Necker and Laysan islands).

Ostracion camurum Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 396, fig. 9, 1899 (1901) (type loc., Honolulu).—Jenkins: op. cit., vol. 22, p. 486, 1902 (1903) (Honolulu).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 945, 1904 (Honolulu).—Snyder: U. S. Fish Comm., Bull., vol. 22, p. 535 1902 (1904) (Puako Bay).

Ostracion punctatus (non Bloch) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 118, 1900 (1901) (Guam; part).

Ostracion oahuensis Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 300, 1902 (1903) (Honolulu).—Jenkins: op. cit., p. 487 (type; Honolulu).—Snyder: op. cit., vol. 22, p. 535, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 443, pl. 51, 1903 (1905) (types).

Head 3 3/5; depth 3 1/8; D. 1, 8; A. 1, 8; snout 1 1/5 in head; eye 4 1/5; interorbital 1 1/4; head width 1. Upper snout profile straight. Interorbital wide, level. Carapace with 4 blunt ridges, spineless and forms wide bony bridge across back of tail; back and belly widely convex. Trunk and head with large round whitish spots, more numerous than plates. On head spots not distinct before interorbital, on cheeks and prepectoral region. Caudal peduncle spotted whitish, but not vertical fins and pectoral.

In the Academy a dry specimen from Thornton Island 159 mm. long. The National Museum has a specimen from the Hawaiian islands obtained by the Wilkes Expedition and also 2 from Tahiti through the same. Through the Bureau of Fisheries 1 from Honolulu, 2 Hawaiian, 1 Samoa, types of *Ostracion camurum* and *Ostracion oahuensis.* In the Bishop Museum 1 Oahu, 7 Honolulu, 1 Guam, 1 Tahiti, 1 Rarotonga, 1 Faté. Largest 150 mm. Two from Wake Island, 1 from Necker, and 1 from Laysan in 1923. The Agassiz Museum has 6 from the Society Islands and 2 Hawaiian, all obtained by Andrew Garrett.

The slightly concave profile and uniform color-pattern of the sides and lower surface will serve to easily distinguish this species.

Zanzibar, East Indies, Melanesia, Micronesia, Polynesia, Hawaii.

Ostracion lentiginosum Schneider.

Ostracion lentiginosus Schneider: Systema ichth., Bloch, p. 501, 1801 (type loc., India circa Insulam Francicam) (on *Le Ostracion pointillé* Lacépède: Hist. nat. Poiss., vol. 1, pp. 442, 455, pl. 21, fig. 1, 1799, type loc., Mauritius).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 437, 1907 (South Sea islands).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 21, 30, 35, 36, 1925 (Guam; Honolulu; Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 30, 1925 (Johnston and Wake islands).

Ostracion lentiginosum Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 487, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 535, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 443, 1903 (1905) (Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 79, 1906 (Faté; Nukuhiva).

Ostracion punctatus Hollard: Ann. Sci. Nat. Zool., vol. 7, p. 165, 1857 (Grand Ocean; Polynesia).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 98, 1860 (New Guinea).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 40, 1874 (South Sea).—Streets: U. S. Nat. Mus., Bull., no. 7, p. 94. 1877 (Samoa).—Bleeker: Arch. Neerl. Sci. Nat., vol. 13, p. 38, 1878 (New Guinea).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 496, 1899 (Thornton Island).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 118, 1900 (Guam).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 517, 1901 (Honolulu).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 454, 1910 (South Sea; Hawaiian islands).

Ostracion punctatum Smith and Swain: U. S. Nat. Mus., Proc., vol. 5, p. 140, 1882 (Johnston Island).

Ostracion (*Ostracion*) *punctatus* Bleeker: Atlas ichth., vol. 5, p. 39, pl. (2) 202, fig. 4, 1865 (New Guinea).

Ostracion meleagris Schmeltz: Mus. Godeffroy, Cat. 4, p. 27, 1867 (Viti islands; Samoa).

Head 3 2/3 to 3 3/4; depth 3; D. 1, 8, varies 7 to 9; A. 1, 8; snout 1 1/4 to 1 1/3 in head; eye 2 3/4 to 3 1/4; interorbital 1 1/8 to 1 1/4; head width 1 to 1 1/5. Upper profile of snout slightly concave. Interorbital wide, supraocular slightly elevated each side. Carapace with 4 blunt ridges, spineless, forms wide bony bridge across back of tail; back and belly broadly convex. Dull brownish, everywhere except on dorsal, anal pectoral and naked muzzle with minute crowded whitish dots, largest on belly.

In the Academy 1 from Samoa, 3 Thornton Island, 2 South Pacific. Largest 148 mm. The Bishop Museum has 2 from Faté, 8 Honolulu, 2 Nukuhiva, 2 Guam, 3 from Johnston Island, and 3 from Wake Island in 1923. In the National Museum 1 Hawaiian and 2 from Fiji, obtained by the Wilkes Expedition. Also 1 Jarvis Island through S. A. Goldschmidt, 1 Johnston Island, 6 Samoa of which 1 through Steinberger and 4 Hawaiian specimens through the Bureau of Fisheries. In the Agassiz Museum 5 Hawaiian through Andrew Garrett, 1 Society Islands through Andrew Garrett, and 2 Kusaie in the Caroline Islands through Rev. B. G. Snow. Largest 152 mm.

Zanzibar, Madagascar, Mauritius, Ceylon, East Indies, Melanesia, Micronesia, Polynesia, Hawaii.

Ostracion solorensis Bleeker.

Ostracion solorensis Bleeker: Nat. Tijds. Ned. Ind., vol. 5, p. 96, 1856 (type loc., Lawajong, Solor).—Günther: Mus. Godeffroy, Jour., vol. 9. pt. 17, p. 455, 1910 (Duke of York Island).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 30 (Johnston Island).

Head 2 7/8; depth 2; D. 1, 8; A. 1, 8; snout 1 3/5 in head; eye 1 2/3; interorbital at hind eye edges 1.

Body depressed, broader below than deep, width 1 3/5 in combined head and trunk; 4 ridges, spineless or only very broad point on upper lateral ridge opposite pectoral tip. Slight spine postmedianly on back close before dorsal; slight broad point above eye. Caudal peduncle very slender, compressed, least depth 1 1/3 in eye. Head broad, pyramidal, length 3/4 its width at gill openings. Snout oblique, length 7/8 its width at front of eyes. Eye elevated, impinging on upper profile, within last half of head length; 1 3/4 in snout, 2 2/3 in hind interorbital width. Mouth very small, inferiorly terminal, width about half of eye. Teeth small, simple, conic, uniserial. Nostrils close before eye. Interorbital broadly concave. Gill opening close before and above pectoral base, 2 2/3 in eye. Scutes with reticulating striae. Second branched dorsal ray 2 in head; second branched anal ray 1 7/8; caudal 1 1/4, rounded convexly behind; pectoral 1 2/5.

Upper half of carapace blackish dorsally, mostly with moderate gray-blue spots, close-set anteriorly and posteriorly giving place to fewer and larger ones with gray-blue line each side of dorsal fin; upper half of side with 3 gray-blue lines, some spots forward and above. Lower half of side brownish, grayish below with 2 longitudinal dusky lines variously brown into spots behind. Carapace uniform pale yellowish. Fins dilute yellowish. Caudal with dusky dots. Pectoral with brown base. Iris grayish. Length 53 mm.

In the Bishop Museum 1 from Johnston Island secured by the Whippoorwill in July 1923.

Known previously only from the East Indies.

Ostracion ornatus Hollard.

Ostracion ornatus (Guichenot) Hollard: Ann. Sci. Nat., Zool., vol. 7, p. 166, 1857 (type loc., Marquesas Islands).

D. 9; A. 9; P. 10. Carapace with 4 ridges, spineless. Somewhat pointed predorsal protuberance, with radiating lines, 1 median, 2 anterolateral and 2 posterolateral. Front depressed. Flanks and back dotted white or brown, on abdomen dots brown, larger and bordered brown. Two pale lateral bands, bordered brown; lower broader, more constant, from gill opening and other along upper edge of body. Sometimes lower band extends to jaws and bifurcates and one fork crosses from eye to other. Length 120 mm. (Hollard)

Ostracion nasus Bloch.

Ostracion nasus Bloch: Nat. ausländischen Fische, pt. 1, p. 118, pl. 138, 1785 (type loc., Nile).—Hollard: Ann. Sci. Nat., Zool., vol. 7, p. 160, 1857 (New Guinea).—Günther: Cat. fishes Brit. Mus., vol. 8, p. 263, 1870 (Pacific Ocean).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 18, 1877 (Pelew Islands).—Günther: Mus. Godeffroy. Jour., vol. 9, pt. 17, p. 456, 1910 (Pelew Islands).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 334, 1911 (Moen, Truk Group, Carolines; Suva, Fiji).

Ostracion (*Ostracion*) *nasus* Bleeker: Atlas ichth., vol. 5, p. 56, pl. (4) 204, fig. 2, pl. (2) 202, fig. 5, 1865 (New Guinea).

Lactophrys nasus Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 117, 1900 (Guam).

Ostracion tuberculatus (non Linné) Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 135, 1902 (1903) (Marcus Island).

Ostracion renardi (non Bleeker) Seale: Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 77, 1906 (Rarotonga; Nukuhiva).

Head 3 1/5; depth 2 2/5; D. 1, 8; A. 1, 8; snout 1 1/3 in head; eye 2 7/8; interorbital 1 1/3. Least depth of caudal peduncle 3 in head. Head width equals its length. Keels on body all entire, without spines; distinct lower ridge or keel down median line of back. Front profile of snout convex, then concave. Interorbital concave, supraorbitals elevated convexly and broadly. Second branched dorsal ray 2 1/8 in head; second branched anal ray 2 1/10; caudal 1; pectoral 1 1/3. Body with irregular round scattered blackish spots, little smaller than pupil, most numerous forward or on head and none on fins.

The Bishop Museum has 1 from Rarotonga, 1 Nukuhiva, 1 Marcus Island, and 1 from Guam. Length 18 to 75 mm. One in the National Museum from Moen. One in the Agassiz Museum from Suva.

East Indies, Micronesia, Polynesia.

Ostracion cornutus Linné.

Ostracion cornutus Linné: Systema nat., 10th ed., p. 331 (type loc., India).—Hollard: Ann. Sci. Nat., Zool., vol. 7, p. 158, 1857 (Polynesia).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 98, 1860 (New Guinea).—Jouan: Soc. Cherbourg, Mem., vol. 8, p. 247, 1861 (New Caledonia).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 27, 1869 (Samoa).—Günther: Cat. fishes Brit. Mus., vol. 8, p. 265, 1870 (Fiji; New Guinea).—Günther: Rept. voyage "Challenger," vol. 1, p. 36, 1880 (Ovalau, Fiji).—DeVis: Linn. Soc. New South Wales, Proc., vol. 8, p. 457, 1883 (New Ireland).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 46, 1885 (Rubi, New Guinea).—Vaillant: Soc. Philom. Paris, Bull., 7th ser., vol. 11, p. 52, 1886-87 (Tahiti; Paumotus).—Pellegrin: Mus. Paris, Bull. 4, p. 228, 1898 (Mariannes).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 118, 1900 (Agaña, Guam).—Bryan and Herre: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, p. 135, 1902 (1903) (Marcus Island).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1414, 1906 (Upolu).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 437, 1907 (South Sea Islands).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 457, pl. 171, 1910 (Fiji; Society Islands).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 334, 1911 (Tongatabu, Tonga Islands).—Fowler: B. P. Bishop Mus., Bull. 22, p. 21, 1925 (Guam).

Ostracion cornutum Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 75, 1906 (Tahiti; Shortland Island).

Lactoria cornuta Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 368, 1905 (1906) (Apia).

Ostracion (Acanthostracion) arcus Kner: Reise "Novara" Fische, vol. 3, p. 404, 1865 (Tahiti).—Bleeker: Atlas ichth., vol. 5, p. 35, pl. (2) 202, fig. 3, pl. (4) 204, fig. 4, 1865 (New Guinea).

Ostracion arcus Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 597, 1882 (New Guinea).

This and the following species all have carapace 4-ridged, forming a broad bridge across back of tail. It differs in the long conic spine above each orbit, which directed forward, also end of each ventral ridge with long spine pointing backward. Also no median spine on back. Caudal greatly elongated with age, rays simply bifid. Spots of blue and black size of pupil, moderate in number.

The Academy has 1 from the South Pacific, a dry specimen 63 mm. long without caudal. Large conic spine forward from each orbit and 1 back from each ventral ridge same size. Carapace 4-ridged and forms moderate firm bridge behind dorsal. Median keel of back slight, raised to little point medianly. Interorbital greatly concave. The Bishop Museum has 1 from Honolulu, 3 Tahiti, 1 Shortland Island, 1 Marcus Island, 4 from Agaña on Guam, 3 Nukuhiva. Largest 418 mm. In the National Museum 1 from Fiji and 1 Tahiti collected by the Wilkes Expedition. Through the Bureau of Fisheries 1 from Tonga, 1 Hawaiian, and 1 Samoa. The Agassiz Museum has 4 from the Society Islands through Andrew Garrett.

Red Sea, Zanzibar, Mozambique, Natal, Madagascar, Mauritius, Seychelles, India, East Indies, Siam, China, Queensland, Micronesia, Melanesia, Polynesia, Hawaii.

Ostracion diaphanus Schneider.

Ostracion diaphanus Schneider: Systema ichth., Bloch, p. 501, 1801 (no type locality).—Hollard, Ann. Sci. Nat., Zool., vol. 7, p. 157, 1857 (Indian Ocean; Polynesia).—Günther: Cat. fishes Brit. Mus., vol. 8, p. 264, 1870 (Pacific Ocean).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 456, 1910 (South Seas).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 30, 1925 (Lisiansky and Laysan islands).

Lactoria schlemmeri Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 945, 1904 (type loc., Laysan island).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 444, 1903 (1905) (types).

Ostracion schlemmeri Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pls. 52-53, 1903 (1905).

Ostracion dexteri Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 75, fig. 8, 1906 (type loc., Bellingshausen Islands, Society Group [No. 1526]).

Head 4; depth 3; D. 1, 8; A. 1, 8; P. 1, 9; snout 1 1/4 in head; eye 4 1/4; interorbital 1 3/5. Least depth of caudal peduncle 2 7/8 in head. Head width equals its length. Upper profile of snout double convex. Interorbital moderate, deeply concave. Short spine in front of each eye; another median before dorsal, opposite which on each side or on dorsal-lateral keel another; lower lateral keel ends in spine directed back, with smaller one median or opposite median dorsal spine and still another midway between latter and posterior, or opposite dorsal origin. Color in alcohol pale brown, with darker marblings and few spots above.

The Bishop Museum has the type of *Ostracion dexteri*, 1 from Honolulu and 1 from Shortland Island. Largest 304 mm. Two from Lisiansky and 1 from Laysan in 1923. In the National Museum 1 Hawaiian specimen 314 mm. obtained by the Wilkes Expedition. The Agassiz Museum has 1 from Maui through C. F. Winslow and 1 Pacific Ocean through Mr. Barker.

Cape of Good Hope, East Indies, Japan, Melanesia, Polynesia, Hawaii.

Ostracion fornasini Bianconi.

Ostracion fornasini Bianconi: Nuovi Ann. Soc. Nat. Bologna, 2nd ser., vol. 5, p. 115, 1846 (type loc., Mozambique).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 457, pl. 170, figs. B—B', 1910 (Oahu).—Fowler: B. P. Bishop Mus., Bull. 22, p. 30, 1925 (Honolulu).

Ostracion diaphanus (non Schneider) (Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 517, 1901 (Laysan; Hawaii).

Lactoria galeodon Jenkins: U. S. Fish Comm., Bull. 22, p. 487, fig. 34, 1902 (1903) (type loc., Honolulu).—Snyder: op. cit., vol. 22, p. 535, 1902 (1904) (Honolulu).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 945, 1904 (Hilo—from *Coryhaena hippurus*).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 445, fig. 196, 1903 (1905) (type; Hilo; Kaulua).

Differs from *Ostracion diaphanus* according to Günther in that bridge across back of tail formed by 3 transverse series of scutes (compared with 4) preorbital spines parallel or slightly convergent (compared with divergent), no spine on lateral dorsal ridge and ventral spine ending in single claw-like spine. Body with irregular blue and black markings.

The Bishop Museum has 5 from Honolulu, 52 to 71 mm. None show any spines on the dorsolateral ridges.

The National Museum 3 without locality and 1 Hawaiian, collected by the Wilkes Expedition. Also type of *Lactoria galeodon* and 4 Hawaiian.

Zanzibar, Mozambique, Mauritius, East Indies, China, Hawaii.

Aracana aculeata (Houttuyn).

Ostracion aculeatus Houttuyn: Hollandichen Maatsch. Wet. Haarlem., Verh., vol. 20, pt. 2, p. 346, 1782 (type loc., Japan).—Schneider: Systema ichth., Bloch, p. 500, 1801 (on Houttuyn).

Aracana spilonota Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 626, fig. 242, 1903 (1905) (type loc., Laysan Island, 57 to 163 fathoms).

Head 3 1/4; depth 2 1/4; D. 10; A. 9; snout 1 1/5 in head; eye 1 3/4, 1 1/2 in snout. Body with 6 ridges; pair of strong spines near middle of dorsal ridges and corresponding smaller pair near middle of ventral ridges. Free part of tail covered with small movable plates. Grayish olive above, lighter below. Back and above with small round greenish spots, 1/3 of pupil. Fins unmarked. Length 94 mm. (Gilbert)

Japan, Hawaii.

CANTHIGASTERIDAE

Canthigaster amboinensis (Bleeker).

Psilonotus amboinensis Bleeker: Ned. Tijds. Dierk., vol. 2, p. 180, 1865 (type loc.. Amboina).

Canthigaster amboinensis Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1414, 1906 (Samoa).

Leiodon patoca Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 298, 1868 (Waigiu).

Tropidichthys psegma Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 209, 1902 (1903) (type loc., Honolulu).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 28, p. 125, 1904 (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, pl. 50, 1903 (1905).

Canthigaster psegma Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 432, 1903 (1905) (type; Honolulu; Samoa).

Tropidichthys oahuensis Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 485, fig. 32, 1902 (1903) (type loc., Honolulu).

Canthigaster oahuensis Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 432, 1903 (1905) (type; Honolulu).

Head 2 7/8; depth (retracted) 2 2/5; D. 11, 10; A. 1, 10; snout 1 2/5 in head; eye 4; interorbital 2 7/8; head width 1 5/6; least depth of caudal peduncle 2 1/5. Head, predorsal line of back and inflatable belly prickly. Second dorsal ray 2 1/4 in head; second anal ray 2 2/3; caudal 1 1/2, convex behind; pectoral 2. Dark umber, becoming whitish on middle of belly. Ten blackish lines radiate from eye, but not meeting above on occiput. Side of head with small rounded dusky spots, fused on lower sides of head into 10 oblique dark lines. Sides of body with rather scattered small dusky spots, some over most all of caudal. Teeth whitish. Lips pale and with fringe of small papillae. Dorsal, anal and pectoral whitish, with contrasted dusky bases. Caudal dark brown.

The Bishop Museum has 1 from Honolulu 94 mm. long. In the National Museum 5 from Fiji in the Wilkes Collection, 33 to 77 mm. Also the types of *Tropidichthys oahuensis* and *Tropidichthys psegma*. One from Pau Olai on Maui near Kihei, February 3, 1900 by Davison and 1 Hawaiian through the Bureau of Fisheries.

East Indies, Polynesia, Hawaii.

Canthigaster jactator (Jenkins).

Tropidichthys jactator Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 399, fig. 11, 1899 (1901) (type loc., Honolulu).—Jenkins: op. cit., vol. 22, p. 485, 1902 (1903) Honolulu).—Snyder: op. cit., vol. 22, p. 535 1902 (1904) (Honolulu; Laysan Island).

Canthigaster jactator Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 430, fig. 187, 1903 (1905) (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 31, 1925 (Laysan and French Frigates Shoal).—Fowler: op. cit., Bull. 38, p. 32, 1927 (Laysan).

Tetraodon margaritatus var. *solandri* (non Richardson) Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 518. 1901 (Laysan).

Head 2 3/5; depth 2 1/4; D. 11, 8; A. 11, 8; snout 1 1/2 in head; eye 5; interorbital 2 4/5; least depth of caudal peduncle 2; head width 1 4/5; second branched dorsal ray 2 3/4; third branched anal ray 2 2/3; caudal 1 3/5; pectoral 2 3/5. Most of body, at least anteriorly or on belly, finely prickly. Dorsal base rather broadly brown.

The Bishop Museum has 2 from Honolulu, 51 and 76 mm. long. One from Laysan and 2 from French Frigates Shoal in 1923. In the National Museum the type of *Canthigaster jactator*.

Canthigaster rivulatus (Schlegel).

Tetraodon rivulatus Schlegel: Fauna Japonica, Poiss., pt. 15, p. 285, pl. 124, fig. 3, 1850 (type loc., Nagasaki Bay).

Tetrodon rivulatus Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 473, 1910 (Hawaii).

Canthigaster rivulatus Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34. p. 66, 1908 (Honolulu).

Tetrodon caudofasciatus (non Günther) Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 518, pl. 3, fig. 3, 1901 (Laysan Island).

Emysterias bitaeniatus Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 400, fig. 12, 1899 (1901) (type loc., Honolulu).

Canthigaster bitaeniatus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 435, fig. 191, 1903 (1905) (type).

Tropidichthys epilamprus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 485, fig. 33, 1902 (1903) (type loc., Kihei, Maui).

Canthigaster epilamprus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 434, fig. 190, 1903 (1905) (type).

Head 2 3/5; depth 2 3/4; D. 1, 9; A. 1, 9; snout 1 3/5 in head; eye 4 1/5; interorbital 2 1/3; least depth of caudal peduncle 2 1/2; head width 1 4/5; second branched dorsal ray 2 3/4; second branched anal ray 2 3/4; caudal 1 1/3; pectoral 2 5/6. Simple scattered prickles on occiput, predorsal sparsely and thickly over belly.

In the Bishop Museum 2 from Honolulu and 1 from Laie on Oahu from C. Montague Cooke III, in 1920. Length 112 to 134 mm. The National Museum has the types of *Emysterias bitaeniatus* and *Tropidichthys epilamprus*.

Japan, Hawaii.

Canthigaster cinctus (Richardson).

Tetrodon cinctus (Parkinson) Richardson: Voyage "Smarang," Ichth., p. 20, 1848 (type loc., Tahiti).

Canthigaster cinctus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 433, fig. 189, 1903 (1905) (Hawaiian islands).—Fowler: B. P. Bishop Mus., Bull. 22, p. 20, 1925 (Guam).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 31, 1925 (Lisiansky).

Tetraodon coronatus Vaillant and Sauvage: Rev. Mag., Zool., 3rd ser., vol. 3, p. 285, 1875 (type loc., Hawaii).

Tetrodon valentini Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 280, 1883 (Hood Bay, New Guinea).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 374, 1897 (Rotuma).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 474, 1910 (Rotuma; New Hannover).

Tetrodon valentyni Pellegrin: Mus. Hist. Nat. Paris, Bull. 18, p. 206, 1912 (Port Sandwich, New Hebrides).

Head 2 3/5; depth 2 1/2; D. 1, 9; A. 11, 8; snout 1 2/5 in head; eye 4 1/3; interorbital 3 1/4; least depth of caudal peduncle 2 3/5; head width 1 4/5; second branched dorsal ray 2 1/3; second branched anal ray 3 1/6; caudal 1 2/5; pectoral 2 3/4.

Color when fresh belly yellow-orange, and black lines extending from eye anteriorly. Dorsal orange. Anal bluish. Caudal umber or orange, black and with scattered blue dots; black on outer margins. Pectoral white.

Two in the Bishop Museum 106 to 112 mm., from Honolulu. Also 17 from sooty tern at Lisiansky in 1923.

Zanzibar, East Indies, Queensland, Melanesia, Polynesia, Hawaii.

Canthigaster bennettii (Bleeker).

Tropidichthys bennettii Bleeker: Nat. Tijds. Ned. Ind., vol. 6, p. 504, 1854 (type loc., Amboina).

Tetrodon bennettii Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 280, 1883 (Hood Bay, New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 471, 1910 (Ponapé; Futuna; Tahiti).

Canthigaster constellatus Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 336, pl. 7, fig. 2, 1911 (type loc., Fakarava, Paumotus).

Large black spot with incomplete bluish edge on back, round base of dorsal. Sides of body with round, rather distant bluish spots size of pupil; spots small and much more numerous on side of head. Foremost part of snout with some bluish vertical bands; eye crossed by subhorizontal bands; bluish band along median line of throat. Back of tail with angular bluish bands, point of angles directed backwards. Caudal uniform. (Günther)

Type and 5 paratypes of *Canthigaster constellatus* in the National Museum. Two in the Agassiz Museum from Fakarava, 42 mm. long.

Zanzibar, East Indies, Queensland, Micronesia, Polynesia.

Canthigaster margaritatus (Rüppell).

Tetraodon margaritatus Rüppell: Atlas Reise Nord. Afrika, Fische, p. 66, 1828 (type loc., Tor, Red Sea).—Günther: Cat. fishes Brit. Mus., vol. 8, p. 300, 1870 (type of *Tetraodon solandri* Richardson).

Canthogaster margaritatus Schmeltz: Mus. Godeffroy, Cat. 4, p. 27, 1869 (Kandavu).

Canthigaster margaritatus Fowler: Acad. Nat. Sci. Philadelphia. Proc., p. 326, 1901 (Thornton Island).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1415, 1906 (Samoa).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 387, 1923 (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 21, 36, 1925 (Guam; Samoa).

Tetrodon (Anosmius) margaritatus Schmeltz: Mus. Godeffroy, Cat. 5, p. 40, 1874 (Samoa).—Waite: Australian Mus., Mem., no. 3, p. 546, 1899 (Funafuti, Ellice Islands).

Tetrodon solanderi (Solander) Richardson: Voyage "Sulphur," Fishes, p. 125, pl. 57, figs. 4-6, 1844 (type loc., Polynesia).—Richardson: Voyage "Samarang," Ichth., p. 19, 1848 (Tahiti).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 27, 1869 (Samoa).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 470, 1910 (Tahiti).

Canthigaster solandri Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 79, 1906 (Raiatea, Society Islands).—Jordan and Seale: (U. S.) Bur. Fish.. Bull., vol. 25, p. 371, 1905 (1906) (Apia; Pago Pago).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, p. 1415, 1906 (Samoa).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 336, 1911 (Borabora, Society Islands; Makemo, Paumotus).—Kendall and Radcliffe: op. cit., vol. 35, p. 166, 1912 (Mangareva, Gambier Islands).—Fowler and Silvester: Carnegie Inst., Marine Pap., p. 124, 1922 (Pago Pago).—Fowler and Bean: U. S. Nat. Mus., Proc., vol. 71, p. 15, 1927 (Tahiti).

Tetrodon (Anosmius) papua (non Bleeker) Schmeltz: Mus. Godeffroy, Cat. 5, p. 40, 1874 (Kandavu).

Tetrodon papua Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 374, 1897 (Rotuma).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 228, 1898 (Saypan, Mariannes).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 118, 1910 (Agaña, Guam).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 471, 1910 (New Britain).

Head 2 1/4 to 2 3/4; depth 2 to 2 1/4; D. 1, 8 or 9; A. 1, 8; P. 11, 14; snout 1 3/5 to 1 3/4 in head; eye 3 to 4; interorbital 2 4/5 to 3; head width 1 1/3 to 2; pectoral 2 1/4 to 3 1/8. Greatly variable in the prickles, largest roughest.

Continuous across interorbital 4 blue brown-edged lines. In smallest but 3 completely continuous. Young with round spots proportionately larger, though equally crowded, but fewer. In largest lateral abdominal blotches forward largest. Often dark blotch at dorsal fin base. In young spots on back often fuse to form more or less transverse lines.

Two in the Academy from Thornton Island, 2 Apia and 3 Pago Pago. Length 29 to 74 mm. The Bishop Museum has 1 from Honolulu, 1 Raiatea and 6 from Agaña on Guam. Length 22 to 100 mm. The National Museum has 1 from Mangareva, 8 Samoa and 1 Borabora. In the Agassiz Museum 12 from the Society Islands through Andrew Garrett and 1 from Makemo.

Red Sea, Zanzibar, Mozambique, East Indies, China, Melanesia, Micronesia, Polynesia, Hawaii.

Canthigaster janthinopterus (Bleeker).

Tropidichthys janthinopterus Bleeker: Nat. Tijds. Ned. Ind., vol. 8, p. 429, 1855 (type loc., Amboina).

Tetrodon janthinopterus Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 471, 1910 (Ponapé).

Sides with numerous white spots formed by network of brown reticulations.

East Indies, Micronesia.

Canthigaster striolatus (Quoy and Gaimard).

Tetraodon striolatus Quoy and Gaimard: Voyage "Uranie," Zool., p. 203, 1824 (type loc., Timor).

Canthogaster margaritatus var. *striolatus* Schmeltz: Mus. Godeffroy, Cat. 4, p. 27, 1869 (Kandavu).

Tetrodon (*Anosmius*) *papua* var. *striolatus* Schmeltz: Mus. Godeffroy, Cat. 5, p. 40, 1874 (Kandavu).

Canthigaster compressus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 79, 1906 (Faté, New Hebrides).

Head 2 1/2; depth (contracted) 2 2/5; D. 1, 7; A. 1, 7; snout 1 4/5 in head; eye 3 1/2; interorbital 3 2/5; least depth of caudal peduncle 3; head width 2. Interorbital slightly concave. Most of body anteriorly finely spinescent. Dorsal length 2 3/5 in head; anal length 3 3/4; caudal convex behind, 1 3/4; pectoral 2 4/5.

Color in alcohol dull brown. Black blotch, long as dorsal, each side base of fin. Dusky band above pectoral base to that of upper caudal lobe and back above with few obscure scattered dusky spots. From eye 4 or 5 dusky lines radiate forward and backward short distance, not crossing head. Each side of snout 2 or 3 short curved dusky lines. Fins all pale brown.

One in the Bishop Museum from Faté, 47 mm. long. One in the Agassiz Museum from Maui, 122 mm. long, obtained by C. F. Winslow.

Differs from *Canthigaster janthinopterus* in that the sides are marked with very fine blue vermiculating lines.

East Indies, Philippines, Melanesia, Polynesia, Hawaii.

TETRODONTIDAE

Sphoeroides lagocephalus (Linné).

Tetraodon lagocephalus Linné: Systema nat., 10th ed., p. 332, 1758 (type loc., India).

Tetrodon lagocephalus Jouan: Soc. Cherbourg, Mem., vol. 9, p. 183, 1863 (on *Tetrodon* Jouan, op. cit., vol. 8, p. 248, 1861, Port de France, New Caledonia).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 461, 1910 (Tahiti; open sea).

Tetraodon (*Anosmius*) *janthinus* Vaillant and Sauvage: Rev. Mag. Zool., 3rd ser., vol. 3, p. 286, 1875 (type loc., Honolulu).

Lagocephalus oceanicus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 199, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 425, pl. 49, 1903 (1905) (types).

Head 2 2/3 to 3 1/3; depth (contracted) 3 1/5 to 4; D. 1, 12 to 14; A. 1, 11 or 12; P. 1, 14; snout 2 1/2 to 3 1/8 in head; eye 2 3/4 to 5 3/4; interorbital 3 to 5. Head width 2 to 2 1/2 in its length. Least depth of caudal peduncle 4 3/4. Inflatable abdomen covered with numerous close-set prickles, each with four-branched roots, body otherwise entirely smooth. Caudal emarginate, lower lobe longer. First branched dorsal ray 2 1/5 in head; first branched anal ray 2; lower caudal lobe 1 1/4; pectoral 1 7/8.

Color in alcohol with back neutral-dusky. Sides and lower surface white. Young with 10 or more rather obscure dusky round spots on side, about size of pupil. Fins largely neutral-dusky. Iris silvery.

One in the Bishop Museum from Honolulu, September 2, 1921, length 415 mm. Young specimen in the Academy from Thornton Island, 84 mm. Type of *Lagocephalus oceanicus* in the National Museum.

Günther places *Tetraodon* (*Anosmius*) *janthinus* Vaillant and Sauvage as a synonym. The large black rounded lateral spots on the sides are not characteristic of the species of *Canthigaster,* to which genus Jordan and Evermann refer it. Likewise, *Lagocephalus oceanicus* is a later synonym, as Günther contends.

South Africa, Mauritius, India, Melanesia, Polynesia, Hawaii. Also in the subtropical and tropical Atlantic.

Sphoeroides lunaris (Schneider).

Tetrodon lunaris Schneider: Syst. Ichth., Bloch, p. 505, 1801 (type loc., Malabar).—Meyer: Soc. Espan. Hist. Nat. Madrid, Anales, vol. 14, p. 47, 1885 (Rubi, New Guinea).

Back usually entirely covered with small spines; abdomen similarly spiny; snout, sides and tail entirely naked. Caudal emarginate. Brown above, sides silvery, abdomen white. Rarely large brown band across back.

Possibly the reference to *Tetrodon richei* by Meyer (op. cit., vol. 14, p. 47, 1885) from Rubi, New Guinea, may refer to this species.

Cape Seas, Zanzibar, East Indies, China.

Sphoeroides sceleratus (Gmelin).

Tetrodon sceleratus Gmelin: Systema nat., Linné, p. 1444, 1789 (type loc., American and Pacific Oceans).—Lichtenstein: Descriptiones animalium, pp. 257, 282, 1844 (New Caledonia).—Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 356, 1877 (Hall Sound, New Guinea).—Macleay: op. cit., vol. 8, p. 280, 1883 (Hood Bay, New Guinea).

Body elongate, tail depressed. Head less than its distance from dorsal. Head and back finely chagrined above; abdomen with very small 3-rooted spines. Side naked. Caudal emarginate. Sides with well-defined silvery band, parts above brownish with small darker or black spots. Brown color completely encircles eye; triangular silvery spot in front of eye. Brownish band round chin runs along and below silvery band. Gill opening deep black. Reaches 683 mm. (Günther)

In the National Museum an adult, skinned out, head 255 mm. long, obtained by William Stimpson at the Bonin Islands.

Zanzibar, Ceylon, East Indies, Philippines, Formosa, Australia, Melanesia, Micronesia.

Sphoeroides oblongus (Bloch).

Tetrodon oblongus Bloch: Nat. ausländischen Fische, pt. 2, p. 6, pl. 145, fig. 1, 1786 (type loc., East Indies).—Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 356, 1877 (Hall Sound, New Guinea).

Tetrodon woodlarkensis Thiollière: Fauna Woodlark, p. 211, 1857 (type loc., Woodlark Island).

Tetraodon albopunctatus Schmeltz: Mus. Godeffroy, Cat. 4, p. 27, 1869 (Samoa).

Head nearly equals its distance from dorsal. Upper teeth not much smaller than lower. Bony interorbital broad with age, equals snout. Back and belly covered with 2-rooted spines, snout and tail naked; sides generally crossed by 2 broad stripes of spines before and behind pectoral. Caudal truncate. Head above and middle of back brown, with round white spots; on sides brown descends in irregular transverse bands; of colors distributed on sides like on middle of back or all upper half of fish brown with round white spots. Often large round black spot above end of pectoral. Reaches 381 mm. (Günther)

India, East Indies, China, Japan, Melanesia, Polynesia.

Sphoeroides hypselogenion (Bleeker).

Tetraodon hypselogenion Bleeker: Nat. Tijds. Ned. Ind., vol. 3, p. 300, 1852 (type loc., Amboina; Wahai, Ceram).

Tetrodon hypselogeneion Günther: Cat. fishes Brit. Mus., vol. 8, p. 277, 1870 (Fiji).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 18, 1877 (Samoa).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1414, 1906 (Samoa).—Günther: Mus. Godeffroy, Jour., vol. 9. pt. 17, p. 462, pl. 172, fig. A, 1910 (Hawaiian islands; Fiji; Samoa).

Spheroides hypselogeneion Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 79, 1906 (Faté).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 368, 1905 (1906) (Apia; Pago Pago).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 334, 1911 (Funafuti. Ellice Islands).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).

Tetrodon florealis Cope: Am. Philos. Soc., Trans., vol. 14, p. 479, 1871 (type loc., Hawaiian islands).

Spheroides florealis Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 514, pl. 20, fig. 4, 1900 (types).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 426, 1903 (1905) (Hilo).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 86, Dec., 1922 (Hawaii).

Head 2 4/5 to 3; depth 3 1/5 to 3 1/3; D. 1, 8; A. 1, 7; head width 1 1/2 to 1 3/5 in its length; snout 2 1/10 from upper jaw tip; eye 4 to 4 1/8; interorbital 3 1/2 to 4 2/3. Spines rather large, wide-set, not especially numerous, present on body except narrow tract from axilla backward and caudal peduncle. Lateral lower keel of caudal peduncle distinct. Greatly faded in alcohol, yellowish lateral band mentioned by Cope still partly evident. Back and head above finely mottled with pale brown. Caudal little darker than other fins, with about dozen fine slightly darker crossbars or lines.

In the Academy the 2 types of *Tetrodon florealis* and a dry skin from Hawaii through J. K. Townsend. The Bishop Museum has 2 from Honolulu, 1 from Laysan obtained by Max Schlemmer in August 1905 and 1 from Faté. Largest 153 mm. The Agassiz Museum has 1 Hawaiian specimen obtained by Andrew Garrett, 1 from the Marshall Islands through Rev. B. G. Snow and 1 from Funafuti. Largest 190 mm. In the National Museum 1 Hawaiian specimen and 2 without locality, obtained by the Wilkes Expedition. Through the Bureau of Fisheries 2 from Samoa and 2 from Funafuti.

Red Sea, Zanzibar, East Indies, Melanesia, Micronesia, Polynesia, Hawaii.

Sphoeroides hamiltoni (Richardson).

Tetrodon hamiltoni Richardson: Voyage "Erebus" and "Terror," Fishes, p. 63, pl. 39, figs. 10-11, 1844-48 (type loc., sea coast of Australia; Tasmania; New Zealand).

Tetrodon hamiltonii Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 463, 1910 (Tahiti).

Tetrodon insularum De Vis: Linn. Soc. New South Wales, Proc., vol. 8, p. 456, 1883 (type loc., Api, New Hebrides).

Back and abdomen covered with minute spines; frequently nothing visible of spines, except pores in which lodged, then entire fish smooth to touch. Snout short, only 1/2 longer than eye and equals width of bony interorbital. Head length less than its distance from dorsal. Lower lateral fold distinct. Caudal rounded. Brown above, with numerous close round black spots. Cheeks with some brown vertical bands or spots. Some large dark blotches on sides. Sometimes an indistinct dark band across back. Lower parts white. Length 140 mm. (Günther)

Australia, Melanesia, Polynesia.

Sphoeroides pleurostictus (Günther).

Tetrodon pleurostictus Günther: Zool. Soc. London, Proc., p. 674, pl. 69, fig. A, 1871 (type loc., Port Bower; Port Mackay, northeast Australia).

Tetrodon laevis De Vis: Linn. Soc. New South Wales, Proc., vol. 8, p. 456, 1883 (type loc., South Seas).

D. 12; A. 8. Form moderately compact. Head equals its distance from dorsal. Snout short, less than interorbital. Nearly smooth, only front of abdomen and middle of back with small spines. Dorsal and anal moderately high, somewhat rounded, opposite. Caudal obtuse. Brownish above, clear on sides, white below. Side with 3 large black blotches, first at upper end of pectoral, second below end of dorsal and third at upper half of caudal peduncle; each spot connected by band. Dark crossband between eyes. Length 128 mm. (Günther)

Liosaccus cutaneus (Günther).

Tetrodon cutaneus Günther: Cat. fishes Brit. Mus., vol. 8, p. 287, 1871 (type loc., St. Helena; Cape of Good Hope?).

Liosaccus cutaneus Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 387, 1923 (Honolulu).

Head 2 3/5; depth (contracted) about 4; D. 11, 6, 1; A. 11, 6, 1; P. 1, 13; snout 2 in head; eye 5 7/8; interorbital 3 1/5.

Body robust, elongate, belly loose, tough or moderately pliable and capable of great inflation. Caudal peduncle depressed, width 3/4 its least depth at same point; least depth 7 in head.

Head large, elongate, about deep as wide when contracted, width 1 2/3 in its length; upper profile little more inclined forward, with slight depression just before nostrils. Snout convex over surface, long as wide. Eye rather small, front edge about midway in head length. Mouth large. Teeth large, with entire even cutting edges. Lips thick, fleshy, greatly papillose. Lower jaw slightly protrudes. Nostril on front and another on hind face of short fleshy knob, which about half diameter of pupil and knob about eye diameter before eye. Interorbital wide, nearly level, twice diameter of eye. Gill opening little inclined, 3 3/4 in head.

Skin entirely smooth, with very fine longitudinal wrinkles or lines on entire trunk and most of inflatable belly. No ridge along side of caudal peduncle. Dorsal inserted about last third in space between front eye edge and caudal base; first branched ray 3 3/4 in head; fin depressed 2 1/3 to caudal base. Anal similar, inserted close behind dorsal base; second branched ray 4 2/5 in head; fin depressed 1 4/5 to caudal base. Caudal with hind edge slightly concave and when expanded tips slightly pointed; fin 2 4/5 in head. Pectoral broad, upper rays forming slight point above and rounded lobe below, larger than dorsal, fin 3 in head.

Color when fresh, according to cast, olive-gray above or on back, blending to purer gray on belly and lower surfaces, without any markings whatever. In alcohol faded uniform dull brown, fins paler and iris pale slaty. Lenth 342 mm.

One in the Bishop Museum, obtained at Honolulu in 1907. Another, 223 mm., was obtained subsequently.

A comparison with the description and figure I published of an Azores specimen (U. S. Nat.

Mus., Proc., vol. 56, p. 206, fig. 3, 1919) shows the above specimens to be the same. I am unable to find any characters to separate the Pacific form from that of the Atlantic. Its occurrence in the tropical Pacific, as well as at Hawaii, is of interest in establishing its great distribution, probably circumtropical.

Tetrodon immaculatus Schneider.

Tetrodon immaculatus Schneider: Systema ichth., Bloch, p. 507, 1801 (on Lacépède: Hist. nat. Poiss., vol. 1, p. 486, pl. 24, fig. 1, 1798, no type locality).—Günther: Cat. fishes Brit. Mus., vol. 8, p. 291, 1870 (New Caledonia; Micronesia).—Günther: Rept. voyage "Challenger," vol. 1, p. 36, 1880 (Ovalau, Fiji).—Waite: Australian Mus., Mem., no. 3, p. 198, 1897 (Funafuti, Ellice Islands).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 119, 1900 (Agaña, Guam).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 528, 1900 (Samoa).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 464, 1910 (South Sea).—Fowler: B. P. Bishop Mus., Bull. 22, p. 21, 1925 (Guam).

Tetrodon (Arothron) immaculatus Schmeltz: Mus. Godeffroy, Cat. 5, p. 40, 1874 (Kanathia).

Tetraodon immaculatus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 79, 1906 (Faté; Shortland Island).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 152, 1913 (Sorong, New Guinea; Majalibit Bay, Waigiu).

Tetrodon unimaculatus Fowler: B. P. Bishop Mus., Bull. 22, p. 36, 1925 (Samoa) (error for *immaculatus*).

Tetraodon virgatus Schmeltz: Mus. Godeffroy, Cat. 4, p. 27, 1869 (Samoa).

Tetrodon virgatus Alleyne and Macleay: Linn. Soc. New South Wales, Proc., vol. 1, p. 356, 1877 (New Guinea).

Tetrodon immaculatus var. *virgata* Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1414, 1906 (Upolu).

Crayracion manillensis Schmeltz: Mus. Godeffroy, Cat. 4, p. 27, 1869 (Kandavu; Port Mackey).

Tetrodon immaculatus manillensis Peters: Akad. Wiss. Berlin, Monatsb., p. 853, 1876 (1877) (New Ireland).

Tetraodon manillensis Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 335, 1911 (Suva, Fiji; Arhno Atoll, Marshalls).

Tetraodon scaber Schmeltz: Mus. Godeffroy, Cat. 4, p. 27, 1869 (Samoa).

Tetrodon reticularis (non Schneider) Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 119, 1900 (Agaña, Guam).

Tetraodon aerostaticus (non Jenyns) Seale: B. P. Bishop Mus., vol. 4, no. 1, p. 79, 1906 (Faté).

Head 2 1/2 to 2 2/3; depth 2 3/5 to 2 4/5; D. 1, 9; A. 1, 9; P. 1, 15 or 16; head width 1 to 1 1/5 its length; snout 2 to 2 1/5; eye 6; interorbital 1 5/6 to 2. Body prickly most everywhere, except on caudal peduncle. Dull brown generally on back and upper surface, whitish below. Back and sides with 28 longitudinal dark brown lines, 22 in young, mostly faded below, closer down middle of back though equally distant in young, oblique on side of head. Fins dull brown, caudal tinged dusky, darker than others and anal pale.

One in the Academy from Samoa, through H. C. Caldwell, 170 mm. The Bishop Museum has 1 from Faté and 2 from Agaña on Guam. In the National Museum 1 from Tongatabu through the Wilkes Expedition. Through the Bureau of Fisheries 1 Arhno Atoll, 3 Samoa, 1 Fiji. The Agassiz Museum has 1 from Suva and from the Kingsmill Islands 4 through Andrew Garrett.

Red Sea, Zanzibar, Natal, Mauritius, East Indies, Philippines, Queensland, Melanesia, Micronesia, Polynesia.

Tetrodon mappa Lesson.

Tetraodon mappa Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 102, pl. 5, 1830 (type loc., Doreh Bay, New Guinea).

Tetrodon mappa Schmeltz: Mus. Godeffroy, Cat. 5, p. 40, 1874 (Savay).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 597, 1882 (New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 464, 1910 (Pelew Islands).

One in the Agassiz Museum from the Society Islands, 266 mm. long. Appears to differ from *Tetrodon meleagris* in having all the pale spots a little coarser, as compared with the series in Cambridge. The above obtained by Andrew Garrett.

Zanzibar, East Indies, Micronesia, Polynesia.

Tetrodon stellatus Schneider.

Tetrodon lagocephalus var. *stellatus* Schneider: Systema ichth., Bloch, p. 503, 1801 (type loc., Mauritius).

Tetrodon stellatus Günther: Cat. fishes Brit. Mus., vol. 8, p. 294, 1870 (Fiji).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 597, 1882 (New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, p. 119, 1900 (Agaña, Guam).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 465, pl. 166, fig. 13, text fig. (young), 1910 (Tahiti; Guam; New Mecklenburg; Faté; Society Islands).—Fowler: B. P. Bishop Mus., Bull. 22, p. 21, 1925 (Guam).

Tetraodon aerostaticus Jenyns: Voyage "Beagle," Zool., p. 152, 1842 (type locality?).

Tetrodon sipui Thiollière: Fauna Woodlark, p. 211, 1857 (type loc., Woodlark Island).—Jouan: Soc. Cherbourg, Mem., vol. 8, p. 249, 1861 (Port de France, New Caledonia).

Crayracion lineatus Kner: Reise "Novara," Fische, vol. 3, p. 408, 1865 (Tahiti).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 27, 1869 (Samoa).

Tetrodon cinctus (non Richardson) Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 466, fig., 1910 (no type locality).

Head 2 3/5; depth (contracted) 3 2/3; D. 6?; A. 7?; snout 2 1/2 in head measured from its own tip; eye 4; interorbital 2 1/4.

Least depth of caudal peduncle 4 in head. Head width 1 2/5 in its length. Body covered with small though prominent prickles. Interorbital level or very slightly depressed. Length of caudal greater than its distance from dorsal, 1 1/3 in head; pectoral 3 3/5.

Color in alcohol brown above, pale to whitish below with 16 blackish longitudinal bands, wide as interspaces. Blackish pectoral blotch present.

In the Bishop Museum 1 from Agaña on Guam, 53 mm. long. The Agassiz Museum has 5 from the Society Islands, obtained by Andrew Garrett, also 1 from Apiang in the Kingsmill Islands through Andrew Garrett and 1 from Ebon Islands, through Rev. B. G. Snow. Largest 203 mm.

Jouan evidently describes it as *Tetrodon,* No. 9, 10 and 11, all from Port de France, New

Caledonia (Soc. Cherbourg, Mem., vol. 8, pp. 248, 249, 1861).

Red Sea, Zanzibar, Mauritius, India, East Indies, Australia, Japan, Melanesia, Micronesia, Polynesia.

Tetrodon reticularis Schneider.

Tetrodon reticularis Schneider: Systema ichth., Bloch, p. 506, 1801 (type loc., Malabar).—Peters: Akad. Wiss. Berlin, Monatsb., p. 853, 1876 (1877) (New Guinea; New Britain).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 597, 1882 (New Guinea).

Arathron reticulatus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 496, 1899 (Thornton Island).

Ovoides reticularis Fowler: Acad. Nat. Sci., Philadelphia, Proc., p. 528, 1900 (correction).

Crayracion testudineus (non Müeller) Bleeker: Atlas ichth., vol. 5, p. 71, pl. (8) 212, fig. 3, 1865 (New Guinea).

Snout short, obtuse, 3 in head, 2/3 width of broad flat interorbital. Very small spines cover whole body from nostrils to caudal root; on abdomen 2, 3 or 4 roots. Caudal equal to space from front dorsal edge. Abdomen with rather numerous brown or black longitudinal bands, obliquely ascending over cheeks to upper part of head, passing on side into brown network, meshes enclosing round whitish spots. Caudal fin with round yellowish spots, separated by blackish network. Reaches 432 mm.

India, East Indies, Melanesia.

Tetrodon hispidus Linné.

Tetrodon hispidus Linné: Systema nat., 10th ed., p. 333, 1758 (type loc., India).—Günther: Cat. fishes Brit. Mus., vol. 7, p. 297, 1870 (Aneiteum).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 40, 1874 (Tonga).—Peters: Akad. Wiss. Berlin, Monatsb., p. 853, 1876 (1877) (New Hannover).—Pellegrin: Mus. Hist. Nat. Paris, Bull. 4, p. 228, 1898 (Guam).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 2, p. 19, 1900 (Honolulu).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 466, pls. 176-177, 1910 (Fanning Islands; Society Islands).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 21, 32, 1925 (Guam; Honolulu).—Fowler: B. P. Bishop Mus., Bull. 38, p. 32, 1927 (Fanning, Christmas and Howland islands).

Tetraodon hispidus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 484, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 534, 1902 (1904) (Honolulu; Necker Island).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 427, pl. 66, 1903 (1905) (Hilo, Moanalua, Honolulu, Waikiki).—Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 319, 1905 (1906) (Apia).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 356, 1906 (Tahiti).—Jordan and Dickerson: U. S. Nat. Mus., Proc., vol. 34, p. 616, 1908 (Suva, Fiji).—Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 152, 1913 (Saonek and Majalibit Bay, Waigiu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 87, Dec. 1922 (Hawaii).

Monacanthus hispidus Thiollière: Fauna Woodlark, p. 215, 1857 (Woodlark Island).

Tetraodon stellatus (non Lacépède) Eydoux and Souleyet: Voyage "Bonite," Zool., vol. 1, p. 212, pl. 10, fig. 2, 1841 (Hawaii).

Monacanthus abassai (Montrouzier) Thiollière: Fauna Woodlark, p. 215, 1857 (name in synonymy).

Arothron laterna Bleeker: Soc. Sci. Ind. Neerl. Ind., Act., no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).

Crayracion laterna Schmeltz: Mus. Godeffroy, Cat. 4, p. 27, 1869 (Samoa).

Tetrodon hispidus var. *laterna* Schmeltz: Mus. Godeffroy, Cat. 5, p. 40, 1874 (Samoa).

Tetrodon laterna Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 280, 1883 (New Guinea).

Tetrodon giganteus Castelnau: Zool. Acclim. Soc. Victoria, Proc., vol. 2, p. 121, 1873 (type loc., Noumea, New Caledonia).

Tetrodon implutus Streets: U. S. Nat. Mus., Bull., no. 7, pp. 56, 78, 1877 (Honolulu; Palmyra and Christmas islands).

Spheroides oblongus (non Bloch) Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 79, 1906 (Faté).

Head 2 2/5 to 3 2/5; depth (retracted) 2 3/5 to 2 5/6; D. 1, 9; A. 1, 9 to 11; P. 1, 16; head width 1 1/10 to 1 1/4 its length; snout 1 7/8 to 2 1/5; eye 5 5/6 to 6 1/4; interorbital 2 1/4 to 2 1/2. Asperities fine, variable; largest specimen uniformly roughest, long bristles on belly and side of head; other examples almost smooth. Dull olive-brown, variably dark, belly and below pale or whitish. Axil and gill opening dusky to blackish, often reflected below on side of belly. Back and head above with scattered small grayish to whitish spots, all less than pupil, crowded at caudal base and on fin basally. Two pale lines encircle gill opening and pectoral base and horizontally below 6 or more along side of abdomen. Dorsal, anal and caudal paler olivaceous than back.

In the Academy 1 from the Pacific Ocean through J. K. Townsend, 2 Thornton Island, and 6 Hawaiian, length 117 to 297 mm. The National Museum has 1 Hawaiian and 1 from Fiji, obtained by the Wilkes Expedition. Also a series of Hawaiian specimens through the Bureau of Fisheries, 1 Samoa, skin from Oahu through W. H. Jones and 6 from the Fanning Islands through T. H. Streets. The Bishop Museum has 11 from Honolulu, 1 Faté, 4 from Palmyra Island in 1922 through Thurston and Thaanum and 1 from Laie on Oahu, November 5, 1922, through Montague Cooke, Jr. and C. M. Cooke III. I found 11 in the Honolulu markets in December, 1922. Largest 336 mm. In the Agassiz Museum 3 from Honolulu through W. H. Jones in 1874, 5 Society Islands through Andrew Garrett, 1 Kingsmill Islands also through Andrew Garrett, 4 Maui through C. F. Winslow, 1 Ebon Island, and 1 Marshall Islands both through Rev. B. G. Snow.

Evidently *Tetrodon giganteus* Castelnau is a very large specimen of this species, based on a specimen 534 mm. long. It is described as dark green, entirely covered with white blotches, very numerous smaller posteriorly than on head; also cover caudal; on sides of belly and head below green color extends as oblique transverse streaks; fins yellowish, pectoral and anal with few white basal spots. This greatly suggests Günther's figure on plate 176, fig. B.

Red Sea, Zanzibar, Mozambique, Natal, India, Ceylon, East Indies, Melanesia, Micronesia, Polynesia, Hawaii.

Tetrodon staigeri Castelnau.

Tetrodon staigeri Castelnau: Linn. Soc. New South Wales, Proc., vol. 2, p. 248, 1878 (type loc., Brisbane River, East Australia).—Weber: Nova Guinea, vol. 5, pt. 2, p. 264, 1908 (Merauke River mouth, south New Guinea).

Orbit 2 1/2 in convex interorbital. Rather large spines cover body except snout and stop just before insertion of dorsal, leaving all posterior part naked; these spines numerous, rather distant from one another and 1 line long; on upper part of body 3-rooted, on belly 4. Caudal equal to its distance to hind dorsal edge. Body dark slaty above, with rounded irregular black spots. Below white. Large obscure spot at pectoral base. Length 100 mm. (Castelnau)

Said to differ from *Tetrodon hispidus* in its longer and more wide-set spines.

East Indies, North Australia.

Tetrodon nigropunctatus Schneider.

Tetrodon nigropunctatus Schneider: Systema ichth., Bloch, p. 507, 1801 (type loc., Tranquebar).—Schmeltz: Mus. Godeffroy, Cat. 5, p. 40, 1874 (Samoa).—Streets: U. S. Nat. Mus., Bull., no. 7, p. 78, 1877 (Fanning Islands).—Günther: Rept. voyage "Challenger," vol. 1, p. 51, 1880 (Arafura Sea in 35 to 49 fathoms).—Macleay: Linn. Soc. New South Wales, Proc., vol. 7, p. 597, 1882 (New Guinea).—DeVis: Linn. Soc. New South Wales, Proc., vol. 8, p. 457, 1883 (New Ireland).—Waite: Australian Mus., Mem., no. 3, p. 197, 1897 (Funafuti, Ellice Islands).—Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1414, 1906 (Upolu).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 468, 1910 (Kubary: Mortlock Island; Fiji; Society Islands).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 21, 36, 1925 (Guam; Samoa).

Tetraodon nigropunctatus Jordan and Seale: (U. S.) Bur. Fish., Bull., vol. 25, p. 369, pl. 35, fig. 70, 1905 (1906) (Apia; Pago Pago).

Crayracion nigropunctatus Bleeker: Atlas ichth., vol. 5, p. 74, pl. (2) 206, fig. 4, 1865 (New Guinea).—Bleeker: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, pp. 281, 298, 1868 (Doreh, New Guinea; Waigiu).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 27, 1869 (Samoa).

Arothron nigropunctatus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 496, 1899 (Thornton Island).

Ovoides nigropunctatus Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 528, 1900 (same specimen).

Tetrodon nigropunctatus var. *citrinella* Günther: Cat. fishes Brit. Mus., vol. 8, p. 293, 1870 (type loc., Fiji).

? Tetrodon punctatus Peters: Akad. Wiss. Berlin, Monatsb., p. 853, 1876 (1877) (New Britain).

Head 2 3/4 to 3; depth 2 1/4 to 2 1/3; D. I, 8 or 9; A. I, 9 or 10; P. I, 17; head width 1 to 1 1/6 its length; snout 2 1/10 to 2 1/5; eye 5 1/4 to 5 3/4; interorbital 1 7/8 to 2. Body largely smooth, larger examples more prickly on middle of back, though most of body with tough leathery skin. Color variable, back light seal-brown, or this extending over whole under surface, which otherwise pinkish-buff. Scattered wide-set black spots, few variable in size, but none larger than pupil and most along sides of belly or on lower surface. Pectoral pale or pinkish-buff and usually same tints on borders of other fins at least. Teeth white.

In the Academy 2 from Pago Pago, 200 to 225 mm. The Bishop Museum has 1 from Faté and 1 from Shortland Island. The National Museum has 1 from Oahu and 1 from Fiji, obtained by the Wilkes Expedition. Also 1 from the Fanning Islands through T. H. Streets and 4 from Samoa through the Bureau of Fisheries. The Agassiz Museum has 2 from Pago Pago, larger 228 mm.

Zanzibar, East Indies, Melanesia, Micronesia, Polynesia.

Tetrodon erythrotaenia Bleeker.

Tetraodon erythrotaenia Bleeker: Nat. Tijds. Ned. Ind., vol. 5, p. 174, 1853 (type loc., Maros, southwest Celebes; Amboyna).

Tetrodon erythrotaenia Weber: Nova Guinea, vol. 9, pt. 4, p. 603, 1913 (Lorentz River and Sabang).

Snout short and obtuse, not much longer than eye, which 1/2 of flat interorbital; eye midway in head length. Spines not numerous, hidden in skin, not extending on snout and tail. Caudal equal to space from dorsal origin. Upper and lateral parts uniform brownish-black, lower white, both defined by sharp red line in life. Length 70 mm. (Günther)

East Indies.

Tetrodon fasciatus Macleay.

Tetrodon fasciatus Macleay: Linn. Soc. New South Wales, Proc., vol. 2, p. 365, pl. 10, fig. 5, 1878 (type loc., Port Darwin, north Australia).—Weber: Nova Guinea, vol. 5, pl. 2, p. 264, 1908 (Merauke River mouth, south New Guinea).

Head 2 4/5; depth (contracted) 2 2/3; eye 3 1/2 in head; gill opening 4. Head and body from eyes to pectorals broad and flat. Nostrils between and rather in front of eyes, with 2 openings on each side opposite one another and in prominent papilla. From behind eyes to opposite middle of pectorals flat upper surface densely covered with small 2-rooted spines; ventral surface from chin to vent similar. Sides and back bluish, under surface yellow with rather sharp line of demarcation. Broad black band between eyes, third across back at dorsal and fourth on back of tail. Length 102 mm. (Macleay)

Tetrodon regani Günther.

Tetrodon regani Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 468, pl. 175, 1910 (type loc., Society Islands).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 30, 1925 (Wake Island).

Head 2 4/5; depth (contracted) 3 2/3; D. III, 9; A. III, 8; P. I, 18; snout to end of teeth 2 in head; eye 7 1/4; mouth width 3 1/2; interorbital 2 1/2.

Body elongate, moderately compressed. Caudal peduncle well compressed, long as deep, least depth 3 1/5 in head. Head width 1 1/2 its length. Snout convex over surface, slight depression above nostril, about long as wide. Eye elevated, front ridge midway in head; 4 in snout, 4 in interorbital. Teeth large, strong, edges of lower more deeply concave. Lips broad, cover most of teeth. Nostrils in small bifid papilla at last 2/5 in snout. Interorbital broad, slightly concave. Gill opening 3 1/2 in head. Most of body with fine close-set asperities; lips, first third of snout, preorbital, postdorsal and entire caudal peduncle smooth; prickles on lower surface of body all much finer and weaker than those on occiput and median predorsal. First dorsal slightly nearer caudal base than gill opening, first branched ray 2 1/6 in head; anal inserted entirely behind dorsal base, third branched ray 2 1/4; caudal 1 3/5, rounded convexly behind; pectoral 2 1/3, broad.

Mouse-gray above, becoming white on lower surface from below level of pectoral, with buff tints along lower side of head and trunk medially. Entire upper surface of head and trunk, also dorsal, anal and caudal, with very numerous close-set round white spots, none larger than pupil. Median membrane of caudal and anal base tinged yellowish or buff, spots obsolete or absent. Gill opening with neutral tint. Pectoral brown, pale basally and marginally, axil yellowish. Eye yellowish. Length 250 mm.

One in the Bishop Museum from Wake Island. Known previously only from Andrew Garrett's figure as reproduced by Günther, and based on a specimen 712 mm. It differs from my specimen entirely in the presence of dark

spots and the sides with finely vermiculate dark lines, though the entire under surface immaculate. The species is very close to *Tetrodon meleagris,* differing chiefly if not entirely in the immaculate whitish under surface of the body.

Tetrodon meleagris Schneider (Pl. XLVIII, *C*).

Tetrodon meleagris Schneider: Systema ichth., Bloch, p. 507, 1801 (on Lacépède: Hist. nat. Poiss., vol. 1, p. 505, 1799 type loc., Asia).—Richardson: Voyage "Sulphur," Fishes, p. 122, pl. 47, figs. 1-3, 1844 (Tahiti).—Günther: Cat. fishes Brit. Mus., vol. 8, p. 299, 1870 (Polynesia).—Smith and Swain: U. S. Nat. Mus., Proc., vol. 5, p. 141, 1882 (Johnston Island).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 469, pls. 173-174, 1910 (Samoa; Ponapé; Marquesas Islands; Society Islands; Tonga; Paumotus; Kingsmills; Tahiti).—Fowler: B. P. Bishop Mus., Bull. 22, p. 36, 1925 (Samoa).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 30, 1925 (Laysan, Lisiansky, Johnston and Wake islands).

Tetraodon meleagris Schmletz: Mus. Godeffroy, Cat. 4, p. 27, 1869 (Savay).

Tetraodon lacrymatus Quoy and Gaimard: Voyage "Uranie," Zool., p. 204, 1824 (type loc., Hawaii).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 944, 1904 (Laysan Island).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 429, fig. 186, 1903 (1905) (type of *Tetraodon lacrymatus* Quoy and Gaimard).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 79, 1906 (Raiatea).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 335, 1911 (Tikei, Fakarava; Makemo, Paumotus).

Arothron ophryas Cope: Am. Philos. Soc., Trans., 2nd ser., vol. 14, p. 479, 1871 (type loc., Samoa).

Ovoides ophryas Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 528, pl. 20, fig. 2, 1900 (type).

Tetraodon orphryas Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 29, p. 356, fig. 3, 1906 (Tahiti).

Tetrodon leopardus Vaillant: Soc. Philom. Paris, Bull., 7th ser., vol. 11, p. 51, 1886-87 (Rikitea, Gambier Islands).

Ovoides latifrons Jenkins: U. S. Fish Comm., Bull., vol. 19, p. 398, fig. 10, 1899 (1901) (type loc., Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, p. 21, 1902 (Honolulu).

Tetraodon setosus Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 79, 1906 (Mangareva).

Head 3; depth (retracted) 2 3/4; D. 1, 9; A. 1, 9; head width 1 1/10 its length; snout 2; eye 6 3/4; interorbital 2 1/6. Prickles small, fine on occipital and predorsal regions, little larger patch along each side of back above and extending down to lower parts of sides; middle of belly with rather large patch of close-set protruding prickles, ends of each with small white cutaneous flap; body otherwise smooth. Generally, at least above, warm sepia. Body marked everywhere with small round, white spots, on back and head above none half size of pupil, concentrated somewhat at muzzle and on caudal peduncle behind to become quite dense all over caudal. On belly and under surface spots become greatly crowded and enlarged, larger than pupil, but none so large as eye. Except basally other fins uniform pale olive-brown.

In the Academy the type of *Arothron ophryas,* 393 mm. long. The National Museum has 2 from Oahu and another likely from Polynesia, obtained by the Wilkes Expedition. Also the type of *Ovoides latifrons,* 1 Fakarava, 1 Makemo, 2 Tuamotus, 1 Hawaiian, and 2 from Johnston Island. The Bishop Museum has 4 from Honolulu, 1 from Laysan Island obtained by Max Schlemmer in August 1905, 1 Mangareva, and 1 Raiatea. Largest 323 mm. Also 1 from Laysan, 1 Lisiansky, 4 Johnston Island and 2 Wake Island in 1923. In the Agassiz Museum 3 Hawaiian specimens obtained by Andrew Garrett, 1 Society Islands, and 1 Kingsmill Islands, both through Andrew Garrett, 1 Ebon Island, and 2 Marshall Islands specimens through Rev. B. G. Snow, and 1 Tiki in the Tuamotus.

Micronesia, Polynesia, Hawaii.

Chelonodon patoca (Buchanan-Hamilton).

Tetrodon patoca Buchanan-Hamilton: Fishes of Ganges, pp. 7, 362, pl. 18, fig. 2, 1822 (type loc., estuaries of the Ganges).

Tetraodon patoca Beaufort: Bijd. Dierk. Amsterdam, vol. 19, p. 152, 1913 (Waiu Waige, Beo, Waigiu).

Body covered with very small spines, snout, tail and band along side naked. Snout obtuse, convex, length little less than convex interorbital width. Brown above, with more or less numerous round whitish spots. Sides silvery and abdomen white. Length 330 mm. (Günther).

India, East Indies.

DIODONTIDAE

Diodon hystrix Linné (fig. 79).

Diodon hystrix Linné: Systema nat., 10th ed., p. 335, 1758 (type loc., India).—Günther: Cat. fishes Brit. Mus., vol. 8, p. 306, 1870 (Society Islands).—Günther: Rept. voyage "Challenger," vol. 1, p. 58, 1880 (Tahiti).—Smith and Swain: U. S. Nat. Mus., Proc., vol. 5, p. 141, 1882 (Johnston Island).—Macleay: Linn. Soc. New South Wales, Proc., vol. 8, p. 280, 1883 (Hood Bay, New Guinea).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, pt. 3, p. 120, 1900 (Agaña, Guam).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 489, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 535, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 437, fig. 192, 1903 (1905) (Honolulu).—Jordan and Seale: U. S. Bur. Fish., Bull., vol. 25, p. 378, 1905 (1906) (Samoa). [Regan: Zool. Soc. London, Proc., (pt. 1), p. 406, 1909 (Christmas Island, Indian Ocean).] Günther: Mus. Godeffroy, Jour., vol. 9, pt. 10, p. 474, 1910 (Hawaiian islands; Society Islands).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 337, 1911 (Papeete, Tahiti).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 88, Dec. 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, p. 22, 1925 (Guam).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 31, 1925 (Laysan and Wake islands).

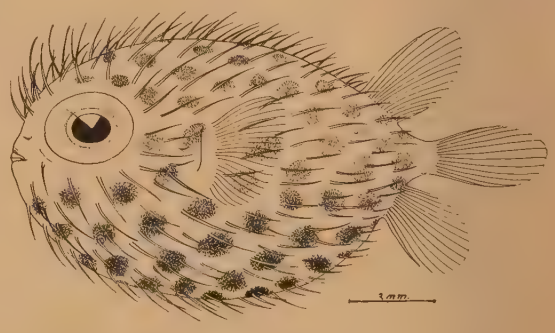

FIGURE 79.—Drawing of young *Diodon hystrix.*

Diodon (Paradiodon) hystrix Schmeltz: Mus. Godeffroy, Cat. 4, p. 27, 1869 (Savay; Kandavu).

Diodon atinga (non Bloch) Jouan: Soc. Cherbourg, Mem., vol. 9, p. 106, 1863 (New Caledonia).

Diodon nudifrons Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 488, fig. 35, 1902 (1903) (type loc., Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 438, fig. 193, 1903 (1905) (Waikiki).—Jordan and Snyder: op. cit., vol. 26, p. 217, 1906 (1907) (Waikiki).

Head 3; depth (collapsed) 2 2/3; D. 1, 12; A. 1, 12; snout 2 2/3 in head; eye 5; mouth width 3; interorbital 1 1/4.

Body elongate, depressed. Caudal peduncle with least depth 1 3/4 in its length or 4 in head.

Head depressed, width equals its length. Snout blunt, obtuse, length in profile 2/5 its width at front of eye. Eye with hind edge midway in head length; diameter 1 3/4 in snout, 3 1/4 in interorbital. Mouth rather small. Lips broad, fleshy, papillose. Teeth smooth, strong. Nasal papilla at last fourth in snout in profile. Interorbital broad, depressed medianly.

Gill opening 3 2/3 in head length. Frontal spines half long as postpectoral spines, which 2 4/5 in head length; second branched dorsal ray 2 1/5; third branched anal ray 2 3/5; caudal 2; pectoral 2.

Back bistre to vandyke-brown, under surface creamy-white. Back and side marked with very numerous, small, rounded, blackish spots. Fins pale brown. Dorsal, caudal and pectoral with rather obscure dark brown spot basally. Length 260 mm.

In the Agassiz Museum 1 from Ebon Island, obtained by Rev. B. G. Snow in April 1877. The Academy has 2 small specimens 13 to 60 mm. long, labeled Pacific Ocean and 1 received through W. H. Jones:

Head 2 to 2 4/5; depth (collapsed) 5 (1 1/2 to 1 4/5); D. 1, 11 to 15; A. 1, 10 to 13; snout 2 1/2 to 3 in head; eye 2 2/3 to 7; mouth width 2 4/5 to 4; interorbital 1 1/2 to 1 3/4; head width 1 to 1 1/2. Frontal spines longer than postpectoral. Small examples with dark brown blotches, each nearly large as pupil and rather well crowded. Spines of young very slender and delicate. Second branched dorsal ray 3 1/4 in head; third branched anal ray 3 2/5; least depth of caudal peduncle 5 4/5; caudal 2 2/3; pectoral 2 3/5.

The Bishop Museum has 5 from Honolulu, 1 Laysan Island in 1903, and 1 from Agaña on Guam, as noted above. Largest 634 mm. One obtained in the Honolulu market November 24, 1922, by J. W. Thompson, who reports it as fairly frequent. The larger specimens all more finely spotted on the back. Also 3 from Laysan, and 1 from Wake Island in 1923. In the National Museum 1 Hawaiian, 1 from Papeete on Tahiti and 1 from Johnston Island.

India, East Indies, Melanesia, Micronesia, Polynesia, Hawaii. Also in the tropical eastern Pacific and Atlantic.

Diodon holocanthus Linné.

Diodon holocanthus Linné: Systema nat., 10th ed., p. 335, 1758 (type loc., India).

Diodon holacanthus Snyder: U. S. Fish Comm., Bull., vol. 22, p. 535, 1902 (1904) (Laysan Island).—Fowler and Ball: B. P. Bishop Mus., Bull., 26, p. 31, 1925 (French Frigates Shoal and Laysan).

Diodon 4-maculatus Cuvier: Mus. Hist. Nat. Paris, Mem., vol. 4, p. 137, pl. (1) 6, lowest figure, 1818 (type loc., Tahiti).

Diodon caeruleus Quoy and Gaimard: Voyage "Uranie," Zool., p. 201, pl. 65, fig. 5, 1824 (type loc., north of New Guinea in E. Long. 142° from Paris).

Cyanichthys coeruleus Kaup: Arch. Naturg., vol. 21, pt. 1, p. 231, 1855 (type loc., New Guinea).

Diodon novemaculatus Bleeker: Soc. Sci. Ind. Neerl., Act. no. 2, vol. 6, p. 3, 1859 (Doreh, New Guinea).

Paradiodon novemaculatus Bleeker: Atlas ichth., vol. 5, pp. 5, 7, pl. (2) 206, fig. 3, 1865 (New Guinea).

Diodon maculatus Günther: Cat. fishes Brit. Mus., vol. 8, p. 307, 1870 (type loc., St. Croix; Jamaica; Hawaii; China; Sulu Sea; Indian Ocean).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 18, 1877 (Pelew Islands).—Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 475, 1910 (Hawaii; Pelew Islands; Ponapé; Ruk; Mortlock Island).

Chilomycterus orbicularis Schmeltz: Mus. Godeffroy, Cat. 5, p. 40, 1874 (Savay).

Diodon maculatus var. *sexmaculatus* Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 518, 1901 (Laysan Island).

Diodon bleekeri Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, pl. 178, 1910 (type loc., Society Islands).

Differs from *Diodon hystrix* in the long frontal spines, usually longer than postpectoral or twice eye with age.

The National Museum has 1 from Oahu and 1 from Tahiti obtained by the Wilkes Expedition. Also 1 from Honolulu through L. Berndt in 1906 and 1 Hawaiian specimen through the Bureau of Fisheries. The Bishop Museum has 1 from French Frigates Shoal and 3 from Laysan in 1923.

Cape of Good Hope, Bourbon, India, East Indies, Philippines, China, Queensland, Micronesia, Polynesia, Hawaii. Also in the tropical eastern Pacific and Atlantic.

Chilomycterus affinis Günther) (Pl. XLIX, *A*).

Chilomycterus affinis Günther: Cat. fishes Brit. Mus., vol. 8, p. 314, 1870 (type locality?).—Snyder: U. S Fish Comm., Bull., vol. 22, p. 535, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 438, 1903 (1905) (Hawaii).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 88, Dec. 1922 (Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 31, 1925 (Necker or Nihoa and Lisiansky islands).

Chilomycterus lissogenys Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 476, pl. 179, 1910 (type loc., Hawaiian islands).

Head 3 1/5; depth 4 2/5; D. 1, 10; A. 1, 12; snout 2 3/5 in head; eye 6 1/2; interorbital 1 3/5; head width 1; third branched dorsal ray 2 1/8; fourth anal ray 2 2/3; least depth of caudal peduncle 5 1/3; caudal 2; pectoral 2 3/5. Though the fins are spotted in all the specimens, in 3 of the larger ones the back is with very few small black spots, these even absent. In the smallest specimen they are very numerous, nearly equal to those of *Diodon hystrix* of the same size.

The Bishop Museum has 4 from Honolulu and 1 from Laysan obtained by Max Schlemmer in August 1905. Length 332 to 650 mm. Also 1 from Lisiansky and 1 from Necker or Nihoa in 1923.

MOLIDAE

Mola mola (Linné).

Tetrodon mola Linné: Systema nat., 10th ed., p. 334. 1758 (type loc., Mediterranean).

Orthagoriscus mola Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 477, 1910 (W. Long. 148° 36′ S. Lat. 44′; W. Long. 146° S. Lat. 13°).

Mola mola Jordan: Copeia, no. 93, p. 28, April 25, 1921 (Kauai, Hawaiian islands).

Differs from *Masturus lanceolatus* in the nearly uniformly narrow border-like caudal without median pointed lobe and its uniformly dark coloration.

Adult in the Honolulu market in 1921 only one seen.

Circumtropical, pelagic.

Masturus lanceolatus (Liénard) (fig. 80).

Orthagoriscus lanceolatus Liénard: Rev. Zool. Soc. Cuvier, p. 292, 1840 (type loc., Mauritius).—Liénard: Rev. Mag. Zool., p. 291, pl. 4, 1841 (Mauritius).

Masturus lanceolatus Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 89, fig. 7, Dec. 1922 (cast in Bishop Museum).—Fowler: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, p. 387, 1923 (Honolulu).

Head 2 2/3; depth 1 3/5; D. VIII. 12 A. VII. 11; P. 10; snout 2 1/4 in head; eye 7 3/4; mouth width 5; interorbital 2 1/4.

Body elongately ovoid, well compressed, deepest at last 2/5 in length, edges all rounded convexly. Head massive or convex above, compressed, sides constricted moderately below, width 2 1/10 in its length. Snout broadly convex, length 7/8 its width. Eye small, elevated, front edge midway in head length, diameter 1 1/2 in orbital socket. Mouth small, transverse, very short gape barely 1/3 of eye diameter, thick fleshy lips concealing teeth and lower jaw slightly protruding so that with closed mouth front profile evenly convex. Teeth formed as single sharp bony cutting-edge in each jaw, its edge only very finely roughened, but producing an even appearance. Tongue broad, fleshy, not free. Nostrils not evident. Interorbital broadly and well convex. Gill opening broad vertical slit about half of snout. Skin finely roughened to touch, narrow smooth area around orbit and broader basal areas at dorsal and anal. Dorsal and anal similar, both united with rather broad membrane to caudal, though anal situated slightly further back; dorsal length 2 1/6 in combined head and trunk; anal length 2 1/4. Caudal ends in median fleshy flap, its length about 1 3/4 in its base (though tip seems to have been damaged); 1 1/3 in head. Pectoral 2 3/4 in head.

Color in alcohol dull brown on back and upper surface, becoming paler on lower side and under surface. Dorsal, anal and caudal with many obscure rounded grayish spots, all smaller than eye and general color of fins dusky. Pectoral dusky, membranes between rays paler. Iris slaty, with well defined buff band, its width about 1/4 eye diameter, slightly inclined from horizontal and crossing so as to embrace lower portion of pupil; also buff spot on lower portion of iris; pupil, except for white band, dusky slate. Length 948 mm.

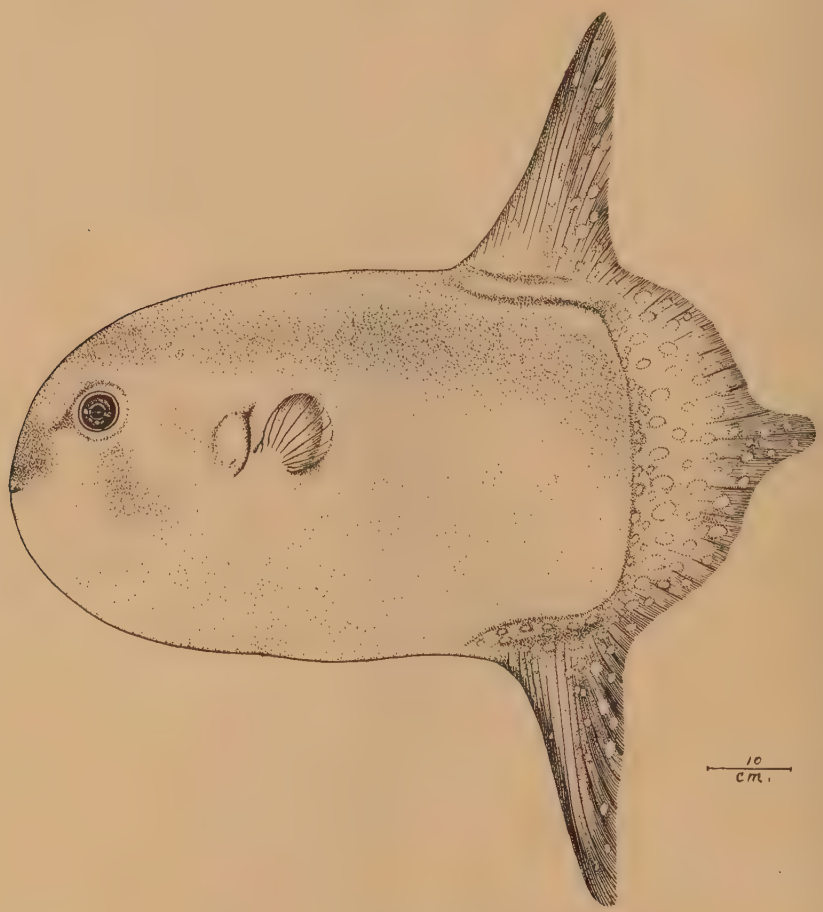

FIGURE 80.—Drawing of *Masturus lanceolatus*.

This species, not previously known from Hawaii or the Indo-Pacific, is represented by a single specimen collected in the Honolulu market in 1919 by J. W. Thompson and now in the Bishop Museum. The cast, on exhibition there, was reported by Jordan and Jordan with a photograph of the same. As this is imperfect in several details, and on account of the rarity of the

species, I have sketched the accompanying figure from the specimen described above. Günther has given a short description, copied from Liénard, as follows: D. 24; A. 24; C. 19; P. 17. Body oblong, covered with a rather rough skin. Caudal fin as long as deep, rounded behind and spotted with gray.

Ranzania truncata (Gmelin).

Tetrodon truncata Gmelin: Systema Nat. Linné, p. 1448, 1789 (type loc., European seas, frequent in Mediterranean).

Ranzania truncata Günther: Mus. Godeffroy, Jour., vol. 9, pt. 17, p. 477, 1910 (Hawaiian islands).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).

Ranzania makua Jenkins: Cal. Acad. Sci., Proc., 2nd ser., vol. 5, pp. 780, 784, pl., 1895 (type loc., Pearl Harbor near Honolulu).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 514, 1900 (Hawaiian islands).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 440, fig. 194, 1903 (1905) (Honolulu).—Jordan and Jordan: Carnegie Mus., Mem., vol. 10, no. 1, p. 89, 1922 (Honolulu).—Jordan, Evermann, Tanaka: Cal. Acad. Sci., Proc., vol. 16, ser. 4, p. 680, 1927 (Hawaii).

The Bishop Museum has 2 specimens from the Honolulu markets, 528 to 559 mm. Mr. J. W. Thompson reports 10 to 15 specimens in the markets during the past 20 years.

A dried skin from the Hawaiian islands, obtained by J. K. Townsend is in the Academy. This fine specimen 475 mm. is likely the first Pacific specimen ever brought to a museum. I reported it in 1900 as *Ranzania makua,* a fact overlooked by Jordan and Evermann. They state *Ranzania makua* differs from *Ranzania truncata* in the smaller eye, situated well above the mouth and above the axis of the body, elevated position of the pectoral, higher dorsal and anal and the coloration. Though I have no specimens for comparison, Day, quoting Couch from an examination of a fresh specimen, says its colors were most brilliant and entirely vanished a few moments after death. The descriptions of these colors do not leave it clear that the coloration of the Hawaiian fish is a specific character. Day's figure is based on a specimen about the size of the above. It shows the mouth-cleft opposite the level of the lower pupil edge, though the description says "opposite the center of the eye," so this is the only possible discrepancy in his description. From a comparison of the above specimen it appears likely this is possibly due to wrong computation in locating the points considered. Thus Day shows the hind caudal edge vertical while my specimen, as in Jenkins' figure, when on a horizontal plane, the hind body edge and caudal slope a little forward. The question of the size of the eye, the location of the pectoral and the height of the dorsal and anal fins appear to me to all be in conformity with the British fish. In Donovan's figure of a British specimen as *Tetrodon truncatus* (Nat. Hist. Brit. Fish., vol. 2, pl. 41, 1803), the eye is shown above the mouth or well above the body axis, though the pectoral falls below the eye and the gill openings.

LOPHIIDAE

Chirolophius moseleyi Regan.

Chirolophius moseleyi Regan: Ann. Mag. Nat. Hist. London, 2nd ser., vol. 11, p. 280, 1903 (type loc., north of New Guinea in 152 fathoms).

Lophius naresi (part) Günther: Rept. voyage "Challenger," vol. 1, p. 56, 1880.

Differs from *Chirolophius naresii* (Günther) in long straight humeral spine, not curved upward as in that species. Second dorsal spine and caudal larger, snout somewhat longer, eyes smaller, interorbital wider. Brown above, lighter below. Dorsal light, with rows of dark spots. Caudal pale, immaculate. Length 80 mm. (Regan)

Chirolophius murrayi Regan.

Chirolophius murrayi Regan: Ann. Mag. Nat. Hist. London, 2nd ser., vol. 11, p. 280, 1903 (type loc., Nares Harbor, Admiralty Islands).

Lophius naresi (part) Günther: Rept. voyage "Challenger," vol. 1, p. 56, 1880.

Pectoral rays 18, instead of 14 as in *Chirolophius naresii* and *Chirolophius moseleyi.* Simple humeral spine curved backward. Snout shorter, eyes larger and interorbital narrower than in first. Brownish above, lighter below. Dorsal and caudal barred with rows of dark spots. Length 205 mm. (Regan)

Lophiomus miacanthus Gilbert.

Lophiomus miacanthus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 691, fig. 273, 1902 (1905) (type loc., off Oahu in 253 to 282 fathoms; Kauai; Pailolo Channel in 228 to 312 fathoms).

D. III-II-8; A. 7. Fringes on head and body moderate, absent from dorsal spines. Light grayish above, much mottled with darker. Filaments on sides of snout arise each from small round light spot, contrasting with darker ground. Under parts lighter, abdomen usually dark, covered with sharply contrasting white flaps. Mouth and gill-cavities white. Length 143 mm. (Gilbert)

In the National Museum 2 Hawaiian specimens.

CERATIIDAE

Chaunax umbrinus Gilbert.

Chaunax umbrinus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 693, fig. 274, 1903 (1905) (type loc., Pailolo Channel between Maui and Molokai).

Head 1 2/3; depth 2 4/5; D. 11; A. 5; P. 14; snout 5 1/5 in head from snout tip; eye 8; maxillary 4. Tentacle occupies 3/4 of groove. Spines short, fine, like shagreen. Skin opaque, dark gray above, mottled and blotched darker. Under parts uniform grayish. Caudal blackish, with lighter crossbar on basal half. Pectoral black, with some grayish basal lines. Ventral yellowish. Length 54 mm. (Gilbert)

Said to differ from the Japanese *Chaunax fimbriatus* Hilgendorf in finer and shorter spines, higher fins and dark color.

Miopsaras myops Gilbert.

Miopsaras myops Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 694, pl. 99, 1903 (1905) (type loc., near Kauai in 409 to 550 fathoms).

Head 2 1/3; depth 2 4/5; D. 4; A. 4; P. 18; caudal 1 1/5 in head. Body narrowly compressed. Eye very small. Anterior profile and mouth cleft directed downward and forward, lower profile rising in nearly straight line to caudal peduncle. No teeth on palate. Skin with fine shagreen. Gill slit little longer than pectoral or 6 in head. Jet-black, mouth cavity with dusky areas. Length 114 mm. (Gilbert)

PEDICALIDAE

Tetrabrachium ocellatum Günther.

Tetrabrachium ocellatum Günther: Rept. voyage "Challenger," vol. 1, p. 45, pl. 19, fig. C, 1880 (type loc., south of New Guinea in S. Lat. 9° 59′ E. Long. 139° 42′ in 28 fathoms).

Head 3; depth 2 1/4; D. I-I-I-18; A. 12; P. 4, 5; V. 5. Body and head strongly compressed; trunk very short; neck raised into convex hump. Eye small, projects on upper surface of head. Mouth cleft vertical, narrow. Teeth very small. Gill opening small pore at lowest part of pectoral root. Skin naked. First and second dorsal spines close together, above upper lip; first very short and slender; second long as mouth width and fringed; third very small, at middle at nape. Dorsal and anal rays short, enveloped in tight membrane. Caudal rounded. Upper half of body brownish, with numerous, variable, white ocelli; extend on dorsal, but other fins uniformly white. Length 70 mm. (Günther)

ANTENNARIIDAE

Histrio histrio (Linné) (figs. 81, 82).

Lophius histrio Linné: Systema nat., 10th ed., p. 237, 1758 (type loc., Pelagic, in Fucus).

Lophius raninus Tilesius: Soc. Nat. Moscow, Mem., vol. 11, pl. 16, 1809 (type loc., Japan).

Antennarius raninus Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, pp. 3, 5, 1859 (Doreh, New Guinea). —Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).

Lophius geographicus Quoy and Gaimard: Voyage "Uranie," Zool., p. 355, pl. 65, fig. 3, 1825 (type loc., near New Guinea).

Chironectes marmoratus Lesson: Voyage "Coquille," Zool., vol. 2, pt. 1, p. 144, pl. 16, fig. 2, 1830 (type loc.,

FIGURE 81.—Drawing of young *Histrio histrio*.

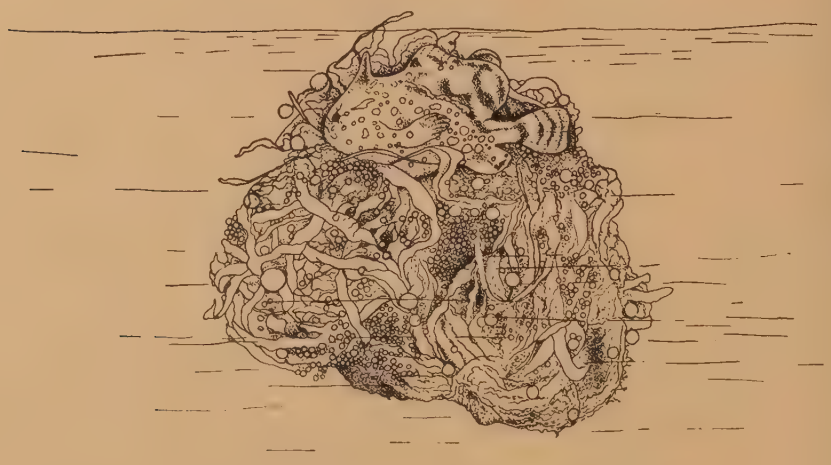

FIGURE 82.—Drawing of *Histrio histrio* on "nest."

New Guinea).—Valenciennes: Hist. nat. Poiss., vol. 12, p. 299, 1837 (New Guinea).

Antennarius marmoratus Bleeker: Atlas ichth., vol. 5, p. 23, pl. (5) 198, fig. 4, pl. (6) 199, fig. 1, 1865 (New Guinea).—Bleeker: Akad. Wet. Amsterdam, Verslagen, 2nd ser., vol. 2, p. 298, 1868 (Waigiu).—Schmeltz: Mus. Godeffroy, Cat. 4, p. 19, 1869 (Kanathia).—Schmeltz: op. cit., Cat. 5, p. 29, 1874 (Viti Islands).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 162, pl. 100, fig. A, 1876 (South Sea).

? Antennarius multiocellatus (non Valenciennes) Schmeltz: Mus. Godeffroy, Cat. 6, p. 15, 1877 (Raiatea).

Skin smooth or granular, without spines. Body marbled or banded black and regular black bands radiate from eye. Fins with more or less regular black bands. Length 127 mm.

Circumtropical, pelagic in open seas.

Antennarius striatus (Shaw and Nodder).

Lophius striatus Shaw and Nodder: Nat. Miscell., vol. 5, pl. 175, 1794 (type loc., New Holland and neighboring isles).

Antennarius striatus Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 162, pl. 99, fig. B, 1876 (Solomons).

Skin rough, tentacles only at throat. Mouth cleft vertical. First dorsal spine longer than second, ends in 3 long band-like flaps and its base separated from second spine. Brown, with blackish parallel streaks, radiating from eye, breaking as spots on belly. Vertical fins with large round black spots. Length 178 mm. (Günther)

Mauritius, Australia, Melanesia.

Antennarius hispidus (Schneider).

Lophius hispidus Schneider: Systema ichth., Bloch, p. 142, 1801 (type loc., Indian Ocean at Coromandel).

Chironectes hispidus Valenciennes: Hist. nat. Poiss., vol. 12, p. 303, 1837 (Borabora; Tahiti).

Antennarius hispidus Schmeltz: Mus. Godeffroy, Cat. 4, p. 19, 1869 (Viti Islands).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 89, 1906 (Raiatea).

Antennarius pinniceps Günther: Cruise of "Curaçoa" (Brenchley), p. 410, 1873 (Solomons).

Antennarius laysanius Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 947, 1904 (type loc., Laysan Island).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, pl. 63, 1903 (1905) (type).

Antennarius lutescens Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 89, fig. 2 (No. 1347), 1906 (type loc., Tahiti).

Similar to *Antennarius striatus* but parallel dark streaks fewer and body and fins marked with pale as well as black spots.

In the Bishop Museum the type of *Antennarius lutescens,* with the bait reaching the base of the second dorsal spine. Also 2 from Honolulu, 1 from Waikiki on December 15, 1916 by W. A. Bryan, from Palmyra 2 from C. Montague Cooke, Jr. in 1913 and 2 from Thurston and Thaanum in 1922, 1 Shortland Island, and 1 at Raiatea. Largest 175 mm.

India, East Indies, Melanesia, Polynesia, Hawaii.

Antennarius commersonii (Shaw) (Pl. XLIX, *B*).

Lophius commersonii Shaw: Gen. zool., vol. 5, p. 387, 1804 (type loc., Indian Seas) (on *Lophie commerson* Lacépède).

Antennarius commersonii Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 163, pl. 100, figs. B-C, pl. 106, 1876 (Raiatea; Bonham Islands; Tahiti; Hawaiian islands; Society Islands; Huahine; Samoa).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 14, 1877 (Tahiti).—Fowler: Acad. Nat. Sci. Philadelphia, Proc., p. 519, 1900 (Hawaii).—Steindachner: Akad. Wiss. Wien, Denk., vol. 70, p. 497, 1901 (Laysan Island).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 5, pp. 20, 21, 1902 (Honolulu).—Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 28, p. 126, 1904 (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 518, 1903 (1905) (Honolulu).—Seale: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, p. 89, 1906 (Shortland Island).—Weber: Siboga Exped., vol. 65, p. 563, 1913 (New Guinea, S. Lat. 1° 42.5′ E. Long. 130° 47.5′ in 32 m.).—Fowler: Copeia, no. 112, p. 84, Nov. 20, 1922 (Hawaii).—Fowler: B. P. Bishop Mus., Bull. 22, pp. 22, 30, 1925 (Guam; Honolulu).—Fowler and Ball: B. P. Bishop Mus., Bull. 26, p. 31, 1925 (Laysan Island).

Antennarius commersoni Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 511, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 537, 1902 (1904) (Honolulu).

Chironectes niger Garrett: Cal. Acad. Sci., Proc., vol. 3, p. 107, 1868 (type loc., Hawaiian islands).

Antennarius commersonii var. *nigro-maculatus* Steindachner: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, p. 1413, 1906 (type loc., Upolu).

Head to end of opercle 1 2/3; depth 1 1/2; D. I-I-I-12; A. 7; P. 10; V. 5; snout 3 1/2 in head measured from upper jaw tip; eye 2 1/2 in snout; maxillary 1 1/3; interorbital 3. Bait, with tip damaged, apparently not reaching middle of second depressed dorsal spine. Length 127 to 136 mm.

In the Academy 2 Hawaiian specimens from J. K. Townsend and 1 from B. Sharp. Those collected by Townsend are dark. In the smaller the bait only reaches 2/5 in second depressed dorsal spine and is surmounted by a filament. It has the black spot at dorsal and anal bases posteriorly, though none on the caudal. Pale band extends down from front of soft dorsal to opercle or towards pectoral axilla. The larger specimen nearly uniform dark chocolate-brown. Both with same fin formula as other specimens. In the National Museum 2 from Maui, 31 to 33 mm., obtained by the Wilkes Expedition. Generally pale, marked with rather large dark blotches. Fins also blotched. Skin fairly smooth and prickles very minute. Also 3 from Honolulu obtained by L. Berndt. The Bishop Museum has 17 from Honolulu, largest 300 mm. long, obtained by H. L. Kelley, January 10, 1922. Several are black in color. The Agassiz Museum has an adult from the Society Islands obtained by Andrew Garrett. Bait reaches origin of second dorsal spine. Color dark chocolate, variegated darker.

Günther shows black spot on last dorsal and anal ray bases, which simply rings in Sharp's specimen. The three large black spots Günther shows on the caudal are very small and inconspicuous in this specimen.

Zanzibar, Mauritius, East Indies, Queensland, Micronesia, Polynesia, Hawaii.

Antennarius sandvicensis (Bennett).

Lophius sandvicensis Bennett: Narrative whaling voyage, vol. 2, p. 258, fig., 1840 (type loc., Oahu).

Antennarius sandvicensis Jordan and Snyder: U. S. Nat. Mus., Proc., vol. 27, p. 948, 1904 (Honolulu).—Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 518, 1903 (1905) (Honolulu).

Apparently like *Antennarius commersonii* but the eye smaller, 3 1/2 in snout.

One in the National Museum obtained by the Wilkes Expedition.

Antennarius nummifer Cuvier.

Antennarius nummifer Cuvier: Mus. Hist. Nat. Paris, Mem., vol. 3, p. 430, pl. 17, fig. 4, 1817 (no type locality).—Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. 5, 1859 (Doreh, New Guinea).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 164, 1876 (Samoa; Raiatea).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 15, 1877 (Raiatea).—Boulenger: Ann. Mag. Nat. Hist. London, 6th ser., vol. 20, p. 373, 1897 (Rotuma).

Antennarius coccineus Schmeltz: Mus. Godeffroy, Cat. 4, p. 19, 1869 (Viti Islands).

Antennarius drombus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 22, p. 207, 1902 (1903) (type loc., Waikiki, near Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 521, pl. 64, 1903 (1905) (type; Samoa).

Head 1 3/4 to 1 4/5; depth 1 2/3 to 1 3/4; D. I-I-I-12; A. 7; P. 10; V. 5; snout 6 to 6 1/4 in head measured from upper jaw tip; eye 8 1/3 to 8 1/2; maxillary 2 7/8 to 3; interorbital 4 1/2 to 6 1/2.

Body compressed, deepest at second dorsal origin, where elevated. Least depth of caudal peduncle 5 in total head length.

Head width 2 in its length. Eye 1 1/4 in snout. Mouth with lower jaw well protruded. Maxillary reaches opposite eye. Teeth slender, conic, irregularly biserial in jaws, lower little longer and depressible; patch of small depressible teeth on each palatine. Nostril small pore nearer eye than snout tip. Interorbital convexly elevated.

Skin finely and firmly asperous, little flexible. Bait little longer than second dorsal spine, ends in rounded fleshy knob not quite reaching third dorsal spine; second spine with 3/4 at least terminally free, not quite reaching base of third spine, which adnate by membrane with back; ninth dorsal ray 2 1/2 to 3 in head; third anal ray 3 1/4 to 3 1/2; caudal 2 1/8 to 2 2/5, rounded convexly behind; pectoral 2 1/2 to 2 3/5; ventral 3 1/3 to 4 1/5.

Pale brown, body marked with rather large close-set rounded brownish spots, not extending on belly or under surface of head. Iris pale, with some white blotches. Fins all pale. Length 40 to 45 mm.

In the Agassiz Museum 1 from Ascension Island, obtained by Rev. A. A. Strong. Also 1 from the Society Islands through Andrew Garrett. The Bishop Museum has 1 from Laysan in 1923.

The type of *Antennarius drombus* in the National Museum, also a specimen from Samoa.

Red Sea, East Indies, Micronesia, Polynesia, Hawaii.

Antennarius dorehensis Bleeker.

Antennarius dorehensis Bleeker: Soc. Sci. Ind. Neerl., Act., no. 2, vol. 6, p. (5) 21, 1859 (type loc., Doreh, New Güinea).—Bleeker: Atlas ichth., vol. 5, p. 19, pl. (6) 199, fig. 7, 1865 (Doreh).

Antennarius dorepensis Bleeker: Nat. Tijds. Ned. Ind., vol. 20, p. 93, 1859-60 (New Guinea).

Differs from *Antennarius nummifer* in the body specked with pearly and violet blotches. According to Bleeker reaches 69 mm.

East Indies.

Antennarius phymatodes Bleeker.

Antennarius phymatodes Bleeker: Soc. Sci. Ind. Neerl., Act. (Amboina), vol. 2, p. 69, 1857 (type loc., Amboina).

Skin rough with small spines. Few short mental tentacles. First dorsal spine long, nearly reaches tip of third dorsal spine and ends in 3 flaps. Yellow, with oblique red band from front of dorsal to opercle and other red blotches behind mouth, on throat and tail. Many small and large blackish-violet scattered ocelli; larger on fins serial. Length 94 mm. (Bleeker)

One in the Agassiz Museum obtained by Andrew Garrett in the Society Islands.

Antennarius leprosus (Eydoux and Souleyet).

Chironectes leprosus Eydoux and Souleyet: Voyage "Bonite," Zool., vol. 1, p. 187, pl. 5, fig., 1841 (type loc., Hawaiian islands).—Thiollière: Fauna Woodlark, p. 189, 1857 (Woodlark Island).

Antennarius leprosus Jordan and Evermann: U. S. Fish Comm., Bull., vol. 23, pt. 1, p. 519, fig. 228, 1903 (1905) (Honolulu).—Fowler: B. P. Bishop Mus., Bull. 38, p. 32, 1927 (Honolulu).

Chironectes peravok (Montrouzier) Thiollière: Fauna Woodlark, p. 189, 1857 (name in synonymy).

Chironectes rubrofuscus Garrett: Cal. Acad. Sci., Proc., vol. 3, p. 64, 1868 (type loc., Hawaii).

Antennarius rubrofuscus Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 511, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 537, 1902 (1904) (Honolulu).

Head 1 3/4 to 1 9/10; depth 1 1/2 to 1 3/5; D. I-I-I-12; A. 7; P. 10 or 11; V. 5; snout 5 to 7 in head measured from upper jaw tip; eye 8 1/2 to 12; maxillary 2 3/5 to 3 1/5; interorbital 4 2/3 to 5.

Body compressed, deepest at second dorsal origin. Least depth of caudal peduncle 4 to 4 3/4 in total head length.

Head width 1 3/5 to 2 4/5 in its length. Snout obtuse. Eye small, 1 1/4 to 2 3/4 in snout. Mouth large, vertical, lower jaw well protruded. Maxillary reaches opposite eye; expansion equals eye. Teeth conic, slender, in bands in jaws, irregularly biserial or in 4 or 5 series, inner larger; patch of small depressible conic teeth on each palatine. Nostril small pore, midway in snout. Interorbital convex.

Skin flexible, finely asperous. Bait slender, tapering, pungent, apparently without terminal filament and reaches slightly beyond third dorsal spine base, about first fifth in that spine; second dorsal spine shorter than bait, not quite reaching base of third spine and terminal half to 3/4 free; third dorsal spine adnate to back by membrane; fifth dorsal ray 3 to 3 1/2 in head; third anal ray 3 1/3 to 4 2/3; caudal 2 1/5 to 2 2/3, convexly rounded behind; pectoral 2 4/5 to 3 2/5; ventral 4 1/4 to 5.

Largely uniform sepia, marked with many round black spots, largest as 5 on soft dorsal, 6 large ones on caudal, 3 on anal, several on side of back and quite a few over abdomen. Many small black spots also scattered about. Small example largely dull uniform brownish, without marblings on head and trunk. Iris pale. Caudal with 2 transverse dark lines, nearly dividing fin into 3 sections. Anal with base and tip of each ray slightly dusky, also tips of rays of paired fins.

In the Agassiz Museum 1 from the Society

Islands 177 mm. long, obtained by Andrew Garrett. Its spots resemble those on Jordan and Evermann's figure, except that they are more numerous. Also the large spots are distributed as noted above and are without distinct pale borders. The damaged bait was likely elongate. Also small specimen, 34 mm. long, from Apiang, Kingsmills, obtained by Andrew Garrett.

Antennarius bigibbus Lacépède.

Antennarius bigibbus (Commerson) Lacépède: Hist. nat. Poiss., vol. 1, p. 325, 1798 (no type locality).—Günther: Mus. Godeffroy, Jour., vol. 5, pt. 11, p. 165, pl. 105, fig. B, 1876 (Paumotus; Hawaiian islands; Huahuine Islands).—Schmeltz: Mus. Godeffroy, Cat. 6, p. 15, 1877 (Paumotus; Tahiti).—Jenkins: U. S. Fish Comm., Bull., vol. 22, p. 511, 1902 (1903) (Honolulu).—Snyder: op. cit., vol. 22, p. 537, 1902 (1904) (Honolulu).—Jordan and Evermann: op. cit., vol. 23, pt. 1, p. 520, 1903 (1905) (Honolulu).—Kendall and Goldsborough: Mus. Comp. Zool., Mem., vol. 26, p. 337, 1911 (Fakarava, Paumotus).

Chironectes tuberosus Cuvier: Mus. Hist. Nat. Paris, Mem., vol. 3, p. 432, 1817 (type loc., Mauritius).—Valenciennes: Hist. nat. Poiss., vol. 12, p. 319, 1837 (Carteret Harbor, New Ireland).

Chironectes reticulatus Eydoux and Souleyet: Voyage "Bonite," Zool., vol. 1, p. 186, pl. 5, fig. 2, 1841 (type loc., Hawaiian islands).

Head 2; depth 1 1/2; D. I-I-I-12; A. 7; P. 9; V. 5; snout 6 in head measured from upper jaw tip; eye 10; maxillary 2 1/5; interorbital 6.

Body compressed, deepest at second dorsal origin. Least depth of caudal peduncle 4 1/5 in total head length.

Head width 2 1/5 in its length. Snout obtuse. Eye small, 1 3/4 in snout. Mouth large, lower jaw well protruded. Maxillary about reaching opposite eye. Teeth slender, conic, irregularly biserial in jaws, lower longer and depressible; patch of small, depressible, conic teeth on each palatine. Nostril small. Interorbital convexly elevated.

Skin finely asperous, flexible. Bait ends in little cutaneous flap, altogether long as second dorsal spine, not reaching base of third dorsal spine; second dorsal spine with 3/4 terminally free, also not reaching base of third spine, end adnate to back by membrane; fifth dorsal ray 1 1/6 in head; third anal ray 2 1/2; caudal 2 1/4, rounded behind; pectoral 2 1/2; ventral 3 2/3.

Mottled brownish with grayish and whitish. Small round black spot at soft dorsal base posteriorly. Edges of soft dorsal, anal and caudal basally paler brownish; terminal 2/3 of caudal with transverse bluish lines, hind edge of fin pale. Length 40 mm.

In the Agassiz Museum 1 from Ebon Island, obtained by Rev. A. A. Strong in 1877. In some respects this fish agrees with Günther's figure (pl. 165, fig. B) though he shows a greatly longer bait, evidently the filament but little less than main stalk of spine. Also 1 from the Society Islands, obtained by Andrew Garrett. Bait extends slightly beyond first dorsal spine and no second dorsal spine. Pale in color with dark blotches, though only on trunk, less on head and few on pectoral. Caudal with 2 subterminal dark lines. Length 44 mm. The Bishop Museum has 1 from Honolulu, 30 mm. long. Generally yellowish-brown in color, but without the black on the trunk shown in Günther's figure. The black marblings on the fins agree. In the National Museum 1 from Fakarava.

Mauritius, Madagascar, East Indies, Micronesia, Polynesia, Hawaii.

Antennarius oligospilos Bleeker.

Antennarius oligospilos Bleeker: Soc. Sci. Ind. Neerl., Act. (Amboina), vol. 2, p. 70, 1857 (type loc., Amboina).—Bleeker: Nat. Tijds. Ned. Ind., vol. 22, p. 99, 1860 (New Guinea).—Bleeker: Atlas ichth., vol. 5, pl. 195 (2), fig. 1, pl. (7) 200, fig. 1, 1865 (New Guinea).

Similar to *Antennarius phymatodes* in long first dorsal spine and rough skin. Flanks with 1 to 4 black ocelli and 1 at base of dorsal and anal. Length 101 mm. (Bleeker)

East Indies.

Antennarius duescus Snyder.

Antennarius duescus Snyder: U. S. Fish Comm., Bull., vol. 22, p. 537, pl. 13, fig. 24, 1902 (1904) (type loc., between Maui and Lanai in 32 to 43 fathoms; Kauai in 75 fathoms).

Head 1 3/4; depth 1 4/5; D. I-I-I-12; A. 7; P. 10; V. 5; snout 6 in head, measured from upper jaw tip; eye 5 1/2; maxillary 3 1/5; interorbital 4 1/4.

Body compressed, deepest at second dorsal origin. Least depth of caudal peduncle 5 in total head length.

Head width 1 4/5 in its length. Snout very obtuse. Eye slightly greater than snout. Mouth large, lower jaw projecting. Maxillary reaches opposite eye in vertical. Teeth biserial, better developed below; small patch on each palatine. Nostril small pore close before eye. Interorbital convexly elevated. Skin rather coarsely asperous, with groups of rougher asperities on upper surface of head. Bait long as second dorsal spine, with terminal cluster of fleshy filaments or tentacles; when depressed filaments reaching third dorsal spine; second dorsal spine terminally 2/3 free, roughly spinescent and not reaching third dorsal spine; last dorsal spine adnate to back by membrane, thick and spinescent; fifth dorsal ray 3 1/5 in total head length; third anal ray 2 3/4; caudal 2, rounded convexly behind; pectoral 3; ventral 4 4/5.

Largely pale or bright brownish, head and trunk with pale or obsolete drab-gray mottlings, some as pale marbled lines on head and trunk. Length 26 mm.

One in the Agassiz Museum from the Society Islands, obtained by Andrew Garrett. The type in the National Museum from Oahu Channel, April 12, 1902.

Antennarius nexilis Snyder.

Antennarius nexilis Snyder: U. S. Fish Comm., Bull., vol. 22, p. 537, pl. 13, fig. 23, 1902 (1904) (type loc., Honolulu).

Head 1 7/8; depth 1 3/4; D. I-I-I-13; A. 7; P. 10; V. 5; snout 5 1/4 in head measured from upper jaw tip; eye 11 2/3; maxillary 2 1/2; interorbital 5.

Body compressed, deepest at second dorsal origin. Least depth of caudal peduncle 4 1/2 in head.

Head width 2 1/8 in its length. Eye small, 1 3/5 in snout. Mouth large, lower jaw well protruded. Maxillary reaches opposite eye. Teeth slender, conic, irregularly biserial in jaws, lower longer and depressible; patch of small depressible conic teeth on each palatine. Nostril small pore, nearer eye than snout tip. Interorbital convexly elevated.

Skin finely though firmly asperous, but little flexible. Bait ends in short, small, filamentous flap, end reaching midway in second dorsal spine; second dorsal spine 2/3 terminally free, about reaches base of third dorsal

spine, which adnate by membrane of back; fifth dorsal ray 3 in total head length; third anal ray 3 1/4; caudal 1 2/3, rounded convexly behind; pectoral 2 1/3; ventral 4.

Brownish generally, marbled with dusky or deeper sepia. Round black spot at soft dorsal base posteriorly. Fins all with more or less dusky-brown terminally, edges all pale, also caudal base. Length 37 mm.

In the Agassiz Museum 1 from the Society Islands obtained through Andrew Garrett. In color-pattern quite similar to the Ebon Island specimen of *Antennarius bigibbus,* but the bait is quite different. Although variegated my specimen of *A. nexilis* does not show the dark spots as represented in Snyder's figure. The National Museum has the type, obtained in 1902.

ONCOCEPHALIDAE

Dibranchus erythrinus Gilbert.

Dibranchus erythrinus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 697, fig. 275, 1903 (1905) (type loc., near Kauai in 403 to 477 fathoms).

Head 1 7/8; width 1 3/4; D. 6; A. 4; P. 15. Disk broadly ovate. Body rough with variously small and large prickles, sometimes ends bifid or trifid. Light carmine, blackish gill cavity and abdominal lining, faintly visible through thin walls. Lower surface suffused purple. Fins little deeper red. Length 172 mm. (Gilbert)

Dibranchus stellulatus Gilbert.

Dibranchus stellulatus Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 698, fig. 276, 1903 (1905) (type loc., off north Maui in 178 to 202 fathoms).

Head 1 2/3; width 1 1/5; D. 6; A. 4; P. 14 or 15. Disk nearly quadrangular. Spines more or less uniform, greatly less numerous than in preceding species. Light olive-brown above, white below. Two small black spots behind each eye, second pair each side of middle of disk and third pair above and in front of each gill opening. Length 67 mm. (Gilbert)

Likely the young of *Dibranchus erythrinus.*

Malthopsis mitriger Gilbert and Cramer.

Malthopsis mitriger Gilbert and Cramer: U. S. Nat. Mus., Proc., vol. 19, p. 434, pl. 48, figs. 1-2, 1897 (type loc., off Hawaiian islands at Stations 3467, 3472, 3476 in 295 to 310 fathoms).

Malthopsis mitrigera Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 695, 1903 (1905) (Molokai; Pailolo Channel; Oahu; Kauai; in 192 to 352 fathoms).

Head 2 1/4?; width 1 3/5; D. 5 or 6; A. 4; P. 14. Nearly everywhere with radially striated tubercular plates. Pale yellowish. Length 76 mm. (Gilbert)

In the National Museum, 5 types.

Malthopsis jordani Gilbert.

Malthopsis jordani Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 695, pl. 100, 1903 (1905) (type loc., south of Molokai in 115 to 134 fathoms; Molokai; Pailolo Channel; Laysan; Maui; in 115 to 178 fathoms).

Head 1 9/10; width 1 3/4; D. 5 or 6; A. 4; P. 12 to 14. Upper surfaces thickly beset by minute spines. Upper parts with fine reticulum of dark lines over grayish or light brownish. Examples from coral sand nearly uniformly white. Length 85 mm. (Gilbert)

One from Hawaii in the National Museum.

Halieutaea stellata (Vahl).

Lophius stellata Vahl: Skr. Naturh. Kjöbenhavn, vol. 4, p. 214, pl. 3, figs. 3-4, 1797 (type loc., Japan).

Halieutaea stellata Weber: Siboga Exped., vol. 65, p. 566, 1913 (near New Guinea in S. Lat. 2° 35.5′ E. Long. 131° 26.2′ in 95 mm.).

Halieutaea stellata var. *vittata* Weber: Siboga Exped., vol. 65, p. 566, 1913 (type loc., Bali Sea; near New Guinea in S. Lat. 2° 35.5′ E. Long. 131° 26.2′; north coast of Sumbawa; in 95 to 274 m.).

D. 4; A. 4; P. 13. Base of each spine with 4 or more radiating ridges. Uniform rose. (Günther)

East Indies, China, Japan.

Halieutaea retifera Gilbert.

Halieutaea retifera Gilbert: U. S. Fish Comm., Bull., vol. 23, pt. 2, p. 696, pl. 101, 1903 (1905) (type loc., off north Maui in 57 to 68 fathoms; off Oahu; Molokai; Pailolo Channel; Hawaii in 53 to 211 fathoms).

Head 1 3/5; width 1 1/4; D. 5; A. 4; P. 14. Covered with minute spines. Edges of body with short filaments, also some scatered over disk. Light olive above, pinkish marginally on disk, all above covered with coarsely reticulating reddish-brown lines. Below light brick-red finely dotted with pearl-white. Caudal white, edged below and behind orange-red, with 3 diffuse yellow crossbands. Length 101 mm. (Gilbert)

In the National Museum, the type.

BIBLIOGRAPHY, WITH ANNOTATIONS

This bibliography includes only those papers which have a faunal scope with reference to Oceania. Further references may be found in Dean's Bibliography of Fishes (vol. 3, pp. 454 to 457, 1923).

ABBOTT, C. C., Description of new species of apodal fishes in the Museum of the Academy of Natural Sciences of Philadelphia: Acad. Nat. Sci. Philadelphia, Proc., pp. 475-479, 1860 (1861).

None of the species described is valid.

AHL, ERNST, Zur Kenntnis der Knochenfischfamilie Chaetodontidae insbesondere der Unterfamilie Chaetodontinae: Arch. Naturg., Abt., A, pt. 5, pp. 1-505, pls. 1-2, 1923.

Of the 26 new specific or subspecific names proposed, 6 pertain to Oceania, none of which is admitted here. The paper is a valuable review of the materials in the Berlin Zoological Museum.

ALLEYNE, H. G., and MACLEAY, WILLIAM, The ichthyology of the Chevert Expedition: Linn. Soc. New South Wales, Proc., vol. 1, pp. 261-281, pp. 321-359, pls. 3-4, 10-17, 1877.

Of 145 species listed 12 are described as new from the coast of New Guinea, though only 1 is valid.

BALL, S. C., 1924, 1925. (See Fowler and Ball.)

BEAN, B. A., A new pelican fish from the Pacific: Smithsonian Misc. Coll., vol. 45, pts. 3-4, pp. 254-255, figs., 1904.

The species *Gastrostomus pacificus* described.

BEAN, B. A., 1923. (See Fowler and Bean.)

BEAUFORT, L. F. DE, 1911-16, 1913, 1915. (See Weber and Beaufort.)

BEAUFORT, L. F. DE, Fishes of the eastern part of the Indo-Australian Archipelago with remarks on its zoogeography: Bijd. Dierk. Amsterdam, vol. 19, pp. 95-163, figs. 1-8, p. 2, 1913.

Scattered through this work are records for 125 species from Waigiu and 7 from New Guinea.

BENNETT, E. T., Observations on the fishes contained in the collection of the Zoological Society, On some fishes from the Sandwich islands: Zool. Jour., vol. 4, art. 13, pp. 31-42, April, 1828-May, 1829.

Of the 11 Hawaiian species described 8 are valid.

BENNETT, E. T., 1839. (See Lay and Bennett.)

BLEEKER, PIETER, Bijdrage tot de kennis der vischfauna van Nieuw-Guinea: Soc. Sci. Indo-Neerl., Act., vol. 6, no. 1, pp. 1-24, 1859.

Lists the Van der Goes collection of 43 species, the Hoedt collection of 48 species and the Von Rosenberg collection of 105 species. Includes a compiled list of 249 species for New Guinea. Of 7 species described as new, only 1 (*Balistes heteracanthus*) is a synonym.

BLEEKER, PIETER, Vischsoorten van Nieuw-Guinea, verzameld door F. G. Beckman: Nat. Tijds. Ned. Ind., vol. 22, pp. 98-100, 1861.

Lists 54 species collected by F. G. Beckman.

BLEEKER, PIETER, Troisième notice sur la faune ichthyologique de la Nouvelle-Guinée: Akad. Amsterdam, Verslagen, 2nd ser., vol. 2, pp. 281-282, 1868.

Lists 14 species from Doreh.

BLEEKER, PIETER, Notice sur la faune ichthyologique de l'ile de Waigiou: Akad. Amsterdam, Verslagen, ser. 2, vol. 2, pp. 295-301, 1868.

Gives a list of 93 species obtained by Bernstein. Later in the same volume at p. 330 he describes *Opisthognathus papuensis* from Waigiu.

BLEEKER, PIETER, Quatrième mémoir sur la faune ichthyologique de la Nouvelle-Guinée: Arch. Néerl. Sci. Nat., vol. 13, pp. 35-66, pls., 1878.

A list of 118 species in the Hamburg Museum. Also a list of 341 nominal species compiled as the fish-fauna of New Guinea. Of 3 new species described, all are valid.

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A list of 108 species is given.

BOULENGER, G. A., Description of a new fish of the gobiid genus Rhiacichthys from British New Guinea: Zool. Soc. London, Proc., pt. 2, pp. 124, 125, pl., 1903.

BRYAN, W. A., and HERRE, A. C., Annotated list of the Marcus Island fishes: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 1, 1902, pp. 125-139, 1903.

The only account of the fishes of this little known island, including an interesting list of 56 species. Of 8 species described as new, none is valid.

BRYAN, W. A., Three new Hawaiian fishes: B. P. Bishop Mus., Occ. Papers, vol. 2, no. 4, pp. 22-37, figs. 2-8, 1906.

All synonyms of previously described species.

CRAMER, FRANK, 1897. (See Gilbert and Cramer.)

DE VIS, C. W., Fishes from South Sea Islands: Linn. Soc. New South Wales, Proc., vol. 8, pp. 445-457, 1884.

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DICKERSON, M. C., 1908. (See Jordan and Dickerson.)

DUNCKER, GEORG, and MOHR, ERNA, Die Fische der Südsee-Expedition der Hamburgischen Wissenschaftlichen Stiftung 1908-09; Zool. Mus. Hamburg, Mitteilungen, vol. 41, pp. 93-112, pl. 2, 1925.

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EVERMANN, B. W., 1903, 1905, 1906. (See Jordan and Evermann.)

EVERMANN, B. W., and SEALE, ALVIN, Notes on fishes from Apia, Samoa: Copeia, no. 119, pp. 70-71, June 16, 1923.

Describes *Caranx sexfasciatus, Kuhlia marginata,* and *Terapon servus.*

EYDOUX, J. F. T. and SOULEYET, F. L. A., Voyage autour du monde exécuté pendant les années 1836 et 1837 sur la corvette "La Bonite": Poissons, vol. 1, pp. 157-216, pls., 1841; tome 1, pp. 1-106, 1841; pp. 107-328, 1842.

Of 7 Hawaiian species described as new, 3 are valid.

FORSTER, J. R., 1844. (See Lichtenstein.)

FOWLER, H. W., Observations on fishes from the Caroline Islands: Acad. Nat. Sci. Philadelphia, Proc., 1899, pp. 482-496, 1900.

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FOWLER, H. W., Contributions to the ichthyology of the tropical Pacific: Acad. Nat. Sci., Philadelphia, Proc., pp. 493-528, pls. 18-20, 1900.

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FOWLER, H. W., Fishes from Caroline Islands: Acad. Nat. Sci. Philadelphia, Proc., pp. 324-326, 1901.

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FOWLER, H. W., Description of a new lantern-fish: Acad. Nat. Sci. Philadelphia, Proc., 754-755, 1903.

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FOWLER, H. W., A list of Hawaiian fishes: Copeia, no. 112, pp. 82-84, November 20, 1922.

FOWLER, H. W., New or little known Hawaiian fishes: B. P. Bishop Mus., Occ. Papers, vol. 8, no. 7, pp. 1-20, 1923.

Of 11 species described as new, 10 are accepted in the present work.

FOWLER, H. W., Fishes of Guam, Hawaii, Samoa and Tahiti: B. P. Bishop Mus., Bull. 22, pp. 1-38, 1925.

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FOWLER, H. W., Note on Serranus zonatus Valenciennes: Copeia, no. 142, p. 39, May 20, 1925.

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FOWLER, H. W., Note on Propoma roseum Günther: Copeia, no. 142, pp. 39-40, May 20, 1925.

Identifies *Rhyacanthias carlsmithi* Jordan with *Propoma roseum* Gunther.

FOWLER, H. W., Notes on Hawaiian fish names: Copeia, no. 155, pp. 138-139, June, 24, 1926.

Gonorhynchus moseleyi Jordan and Snyder identified with *Gonorhynchus gonorynchus* (Linné).

FOWLER, H. W., Note on Paracanthurus Bleeker: Copeia, no. 155, pp. 139-40, June 24, 1926.

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FOWLER, H. W., Note on Exallias obscurus Borodin: Copeia, no. 165, pp. 91-92, December 23, 1927.

Exallias obscurus Borodin identified with *Cirripectes alboapicalis* (Ogilby).

FOWLER, H. W., and SILVESTER, C. F., A collection of fishes from Samoa: Carnegie Inst. Washington, Publ. 312, pp. 109-126, figs. 1-2, 1922.

The list includes 53 species; including *Gnathypops samoensis,* described as new.

FOWLER, H. W., and BEAN, B. A., Descriptions of 18 new species of fishes from the Wilkes Exploring Expedition preserved in the United States National Museum: U. S. Nat. Mus., Proc., vol. 63, pp. 1-27, 1923.

The species from Oceania are *Harengula fijiense, Anchoviella mauii, Uropterygius fijiensis, Strongylura tahitiensis, Strongylura auloceps, Strongylura fijiense, Lepidaplois trotteri, Chromis cupreus* and *Salarias mccullochi.* All are valid except *Lepidaplois.*

FOWLER, H. W., and BEAN, B. A., Notes on fishes obtained in Sumatra, Java, and Tahiti: U. S. Nat. Mus., Proc., vol. 71, pp. 1-15, 1927.

On pages 14-15 is a list of 25 species from the north coast of Tahiti, obtained by Mr. J. Morgan Clements in June 1925. None described as new.

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The species described as new are *Gregorvina gygis, Plectroglyphidodon johnstonianus, Blennius rhabdotrachelus,* and *Rupiscartes quagga.*

FOWLER, H. W., and BALL, S. C., Fishes of Hawaii, Johnston Island and Wake Island: B. P. Bishop Mus., Bull. 26, pp. 1-31, 1925.

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GAIMARD, J. P., 1824. (See Quoy and Gaimard.)

GARMAN, SAMUEL, Some fishes from Australia: Mus. Comp. Zool., Bull., vol. 39, no. 8, pp. 229-241, pls. 1-5, 1903.

Of the 29 species listed 3 are from the Great Barrier Reef; the others from Fiji. Only 1 of the 14 species described as new is from Australia. Of the 13 new species from Oceania 8 are synonyms.

GARRETT, ANDREW, Descriptions of new species of fishes: California Acad. Sci., Proc., vol. 3, pp. 63-66, 103-107, 1863.

Of 8 species described, 5 are still valid.

GILBERT, C. H., The deep-sea fishes. Section 2 of Aquatic resources of the Hawaiian islands: U. S. Fish Comm., Bull. 23, pt. 2, 1903, pp. 575-713, pls. 66 to 101, 1905.

The most elaborate work on the deep-sea fauna of Hawaii. Includes detailed descriptions and good figures of 95 new species, of which 79 are acceptable and 16 fall as synonyms.

GILBERT, C. H., and CRAMER, FRANK, Report on the fishes dredged in deep water near the Hawaiian islands, with descriptions and figures of twenty-three new species: U. S. Nat. Mus., Proc., vol. 19, pp. 403-435, pls. 36-48, 1897.

The first attempt to study the bathypelagic fishes of Hawaii. Of the 23 species described as new 4 are here admitted as synonyms.

GILL, T. N., Conspectus piscium in expeditione ad Oceanum Pacificum septentrionalum, C. Ringold et J. Rodgers, ducibus a Gulielmo Stimpson collectorum, Sicydianae: Acad. Nat. Sci. Philadelphia, Proc., pp. 100-102, 1860.

Describes *Sicydium stimpsoni* and *Sicyogaster concolor.*

GOLDSBOROUGH, E. L., 1911. (See Kendall and Goldsborough.)

GRAY, J. E., Description of three new species of fish from the Sandwich Islands in the British Museum: Zool. Miscell., p. 33, 1831.

Of these species described as new, 1 is a synonym.

GUNTHER, ALBERT, Report on several collections of fishes recently obtained for the British Museum: Zool. Soc. London, Proc., pp. 652-675, pls. 53-70, 1871.

Of 14 species described as new from Oceania, 7 are synonyms.

GUNTHER, ALBERT, Andrew Garrett's fische der Südsee: Mus. Godeffroy, Jour., vol. 1, pt. 1, pp. 1-24, pls. 1-20. 1873; vols. 2, 3, pts. 5-6, pp. 25-96, pls. 21-60, 1874; vol. 4, pp. 96-128, pls. 61-83, 1875; vol. 5, pt. 11, pp. 129-169, pls. 84-100, 1876; vol. 6, pt. 11, pp. 169-216, pls. 101-120, 1877; vol. 7, pt. 15, pp. 217-256, pls. 121-140, 1881; vol. 8, pt. 16, pp. 261-388, pls. 141-160, 1909; vol. 9, pt. 17, pp. 389-519, pls. 161-180, 1910.

Truly an able work. It remains the foundation of knowledge of the fishes of Oceania. The descriptions of many of the 871 species are less detailed than those of more modern writers, especially from American standards. They are, however, at least excellent diagnoses. The numerous illustrations are quite representative and reveal great credit to the indefatigable Andrew Garrett, the veteran field naturalist and collector in the south seas. Easily ranking with some of Günther's other monumental works, such as his Catalogue of Fishes of the British Museum and the Deep-sea Fishes of the Challenger Expedition. The Fische der Südsee marks one of the great epochs in the study of the comparative faunas of the world. Of 52 new species described, 15 are synonyms.

GUNTHER, ALBERT, On a collection of reptiles and fishes from Duke of York, New Ireland and New Britain: Zool. Soc. London, Proc., pp. 127-132, pls., 1877.

On page 132, *Histiopterus typus* is recorded.

GUNTHER, ALBERT, On some new species of reptiles and fishes collected by J. Brenchley, Esq.: Ann. Mag. Nat. Hist. London, 4th ser., vol. 10, pp. 418-426, 1872.

Describes *Ophichthys pinguis* and *Salarias coronatus.*

GUNTHER, ALBERT, Reptiles and fishes of the south sea islands: In Brenchley, J. L., Jottings during the cruise of H. M. S. "Curaçoa" in 1865; Fishes, pp. 409-430, pls. 26-35, 1873.

Gives a list of 68 species from the Solomon Islands, though the 2 described as new were already described in the paper just preceding.

GUNTHER, ALBERT, Report on the Shore Fishes procured during the voyage of H. M. S. "Challenger" in the years 1873-1876, vol. 1, pt. 6, pp. 1-82, pls. 1-32, 1880.

Pages 33-36 of this work list 77 species from Fiji, of which *Petroscirtes oualanensis* is described as new. Pages 57-58 list 20 species from Tonga and Society Islands and describe *Mugil tongae* as new. Pages 59-62 list 27 species from Hawaii, including 5 described as new, of which 2 are valid.

HASE, ALBRECHT, Die Fische der deutschen Grenz Expedition 1910 in das Kaiser-Wilhelms-Land, Neu-Guinea: Jena. Zeitsch., Nat., vol. 51, pp. 525-548, 16 figs., 1914.

Of 4 species named as new, apparently only *Corvina papuensis* may be valid. The other 3 credited to Weber as new species had been described several years previously, and of these Hase needlessly renames *Copidoglanis gjellerupi* as *Copidoglanis papuensis.*

HERRE, A. C., 1903. (See Bryan and Herre.)

HOMBRON, HONORÉ, and JACQUINOT, V., Voyage au Pôle Sud et dans l'Océanie, sur L'Astrolabe et La Zélée, pendant 1837-40, Zool., vol. 3, pt. 2, pp. 29-56, 1853.

Mostly without localities, 16 species are described as new, of which 4 are from Oceania, with 3 here suppressed as synonyms.

JENKINS, O. P., Description of a new species of Ranzania from the Hawaiian islands: California Acad. Sci., Proc., 2nd ser., vol. 5, pp. 779-784, pl., October 31, 1895.

Now believed a synonym of *Ranzania truncata.*

JENKINS, O. P., Descriptions of new species of fishes from the Hawaiian islands, belonging to the families of Labridae and Scaridae: U. S. Fish Comm., Bull., vol. 19, 1899, pp. 45-65. figs. 1-22, August 30, 1900.
Of the 22 species described as new, 3 are tenable.

JENKINS, O. P., Descriptions of fifteen new species of fishes from the Hawaiian islands: U. S. Fish Comm., Bull., vol. 19, 1899, pp. 387-404, figs. 1-16, June 8, 1901.
Of the 15 species described as new, 4 are tenable.

JENKINS, O. P., Report on collections of fishes made in the Hawaiian islands, with descriptions of new species: U. S. Fish Comm. Bull., vol. 22, 1902, pp. 417-511, pls. 1-4, figs. 1-50, September 23, 1903.
Of 55 species described as new, 15 are admitted here.

JENYNS, LEONARD, The zoology of the voyage of H. M S. "Beagle," during the years 1832-1836; edited by Charles Darwin, Fish, pt. 12, pp. 1-32, pls. 8, January 1840; pt. 14, pp. 33-64, pl. 7, June 1840; pt. 16, pp 65-96, pl. 5, April 1841; pt. 17, pp. 97-172, pl. 9, April 1842.
A few scattered references to species obtained at Tahiti. Of 3 described as new, 2 are synonyms.

JORDAN, D. S., Description of deep-sea fishes from the coast of Hawaii, killed by a lava flow from Mauna Loa: U. S. Nat. Mus., Proc., vol. 59, pp. 643-656, figs. 1-8, 1921.
Of 6 species described as new, none is accepted here.

JORDAN, D. S., Notes on certain Hawaiian fishes: Copeia, no. 150, pp. 100-101, January 25, 1926.
Contends validity of *Rooseveltia* and identifies *Symphysanodon* Bleeker 1878 with *Rhyacanthias*.

JORDAN, D. S., Shore fishes of Samoa; Pan-Pacific Research Institution, Jour., vol. 2, no. 4, pp. 3-11, Oct.-Dec., 1927.
A compiled list of 585 names, many of which invalid.

JORDAN, D. S., and DICKERSON, M. CY., On a collection of fishes from Fiji with notes on certain Hawaiian fishes: U. S. Nat. Mus., Proc., vol. 34, pp. 603-617, figs. 1-6, 1908.
Two species described as new are invalid though the generic name *Rastrelliger* is still available.

JORDAN, D. S. and EVERMANN, B. W., Descriptions of new genera and species of fishes from the Hawaiian islands: U. S. Fish Comm., Bull., vol. 22, 1902, pp. 161-208, April 11, 1903.
Of 57 species described, 34 are synonyms.

JORDAN, D. S., and EVERMANN, B. W., Descriptions of a new genus and two new species of fishes from the Hawaiian islands: U. S. Fish Comm., Bull., vol. 22, pp. 209-210, July 9, 1903.
All are admissible.

JORDAN, D. S., and EVERMANN, B. W., The Aquatic resources of the Hawaiian islands: pt. 1, The shore fishes; U. S. Fish Comm., Bull., vol. 23, pt. 1, 1903, pp. 1-574, figs. 1-229, pls. 1-73, 1905.
The most pretentious work on the fishes of the Hawaiian subregion which has appeared. Many descriptions are supplemented with extensive color notes from fresh specimens. The color plates are by Messrs. C. B. Hudson and A. H. Baldwin. Those by Hudson in oil are good portraiture. Altogether a total of 441 species are included, of which subsequent studies show that 100 are synonyms and 66 are inadmissible.

JORDAN, D. S., and EVERMANN, B. W., A check list of the fishes of Hawaii: Pan-Pacific Research Inst., Jour., vol. 1, pp. 3-15, January, 1926.
A list of 653 merely nominal species, including 10 introduced species. Largely an elaboration, most of it compiled without revision, from the work just preceding.

JORDAN, D. S. and JORDAN, E. K., A list of the fishes of Hawaii, with notes and descriptions of new species: Carnegie Mus., Mem., vol. 10, no. 1, pp. 1-92, pls. 1-4, December, 1922.
Including those described by Gilbert and others, 583 species are included. Of the 9 species described as new, all are synonyms.

JORDAN, D. S., and METZ, C. W., Descriptions of two new species of fishes from Honolulu, Hawaii: U. S. Nat. Mus., Proc., vol. 42, pp. 525-527, 2 figs., 1912.
Two species, *Holacanthus potteri* and *Chromis verater*, both valid.

JORDAN, D. S., and SEALE, ALVIN, The Fishes of Samoa, description of the species found in the archipelago, with a provisional check-list of the fishes of Oceania: (U. S.) Bur. Fish., Bull., vol. 25, 1905, pp. 175-455, pls. 33-53, text figs. 1-111, 1906.
Lists a total of 1704 species for Oceania though many are merely nominal. Of the 92 Samoan species proposed as new, 8 are admissible. The idea of a check list of the fishes of Oceania was good in itself but the work is greatly marred by many unfortunate inaccuracies of citation, and typography. Many of the text figures are fair and the 16 colored plates by K. Morita give a good idea of the gaudy coloration of many of the more abundant reef species.

JORDAN, D. S., and SNYDER, J. O., Notes on Collections of fishes from Oahu and Laysan Island, Hawaii, with descriptions of four new species: U. S. Nat. Mus., Proc., vol. 27, pp. 939-948, 1904.
Lists 37 species. Of the 4 supposedly new ones, 2 are synonyms.

JORDAN, D. S. and SNYDER, J. O., Description of a new species of fish (Apogon evermanni) from the Hawaiian islands, with notes on other species: U. S. Nat. Mus., Proc., vol. 28, pp. 123-126, October 6, 1904.

JORDAN, D. S., and SNYDER, J. O., A list of fishes collected in Tahiti by Mr. Henry P. Bowie: U. S. Nat. Mus. Proc., vol. 29, pp. 353-357, figs. 1-3, 1905.
Holocentrus bowiei, described as new, is a synonym of *Holocentrus caudimaculatus* Rüppell.

JORDAN, D. S. and SNYDER, J. O., Notes on fishes of Hawaii, with descriptions of new species: (U. S.) Bur. Fish., Bull., vol. 26, 1906, pp. 207-218, pls. 12-13, text figs. 1-4, October 25, 1907.
Lists 35 species. Of the 5 new species described only *Caranx dasson* appears tenable.

JORDAN, D. S., EVERMANN, B. W., and TANAKA, SHIGEHO, Notes on new or rare fishes from Hawaii: California Acad. Sci., Proc., vol. 16, no. 20, pp. 649-680, pls. 22-24, November 14, 1927.
A descriptive account of 38 species, 8 as new, of which only 1 apparently valid.

JORDAN, ERIC KNIGHT, Notes on the fishes of Hawaii, with descriptions of six new species: U. S. Nat. Mus., Proc., vol. 66, pp, 1-43, pls. 1 and 2, 1925.
None of the new species is tenable.

JOUAN, HENRI, Notes sur quelques espèces de poissons de la Nouvelle-Calédonie: Soc. Imp. Sci. Nat. Cherbourg, Mem., vol. 8, pp. 241-308, 1861.
A descriptive list of 98 species, most of them entered only under the generic name.

JOUAN, HENRI, Supplément a la description des poissons de la Nouvelle-Calédonie: Soc. Imp. Sci. Nat. Cherbourg, Mem., vol. 9, pp. 177-187, 1863.
Descriptions of 7 species and references to 14 species in the paper just preceding.

JOUAN, HENRI, Notes sur l'archipel Hawaiien (Iles Sandwich): Soc. Imp. Sci. Nat. Cherbourg, Mem., vol. 17, pp. 5-104; liste des poissons, pp. 89-92, 1873.
A list of 43 species compiled mostly from old authors and of little value.

JOUAN, HENRI, Quelques mots sur la faune ichthyologique de la côte nord-est d'Australie et du detroit de Torres, comparée a celle de la Nouvelle-Calédonie: Soc. Imp. Sci. Nat. Cherbourg, Mem., vol. 21, pp. 328-335, 1877.
Remarks on 18 species.

KENDALL, W. C., and GOLDSBOROUGH, E. L., Reports on the scientific results of the expedition to the tropical Pacific, in charge of Alexander Agassiz, by the U. S. Fish Commission Steamer "Albatross," from August 1899 to March 1900; The shore fishes: Mus. Comp. Zool., Mem., vol. 26, no. 7, pp. 241-344, pls. 1-7, February, 1911.
Includes 231 species. Of the 8 described as new, 2 are valid.

KENDALL, W. C., and RADCLIFFE, LEWIS, Reports on the scientific results of the expedition to the eastern tropical Pacific, in charge of Alexander Agassiz, by the U. S. Fish Commission Steamer "Albatross," from October, 1904 to March, 1905; The shore fishes: Mus. Comp. Zool., Mem., vol. 35, no. 3, pp. 75-127, pls. 1-8, April 1912.
The species within the limits of Oceania number 72, of these 3 are described as new though 1 is now a synonym.

KITTLITZ, F. H. VON, Beschreibung mehrerer neuer oder wenig gekannter Arten des Geschlechtes Acanthurus, im stillen Ocean, beobachtet und nach dem Leben abgebildet: Mus. Senckenbergianum, Erster Band, pp. 189-196, pls. 12-13, 1834.
Describes 6 species. Of the 3 described as new, all are valid.

KITTLITZ, F. H. VON, Denkwürdigkeiten einer Reise nach dem russischen Amerika, nach Mikronesien und durch Kamschatka, 2 vols., Gotha, 1858.
Mention is made of a few fishes in Oceania in volume 2, pp. 20, 22, 65, 87, 123, 124, 158-161. Includes a few woodcuts.

KNER, RUDOLF, Reise der österreichischen Fregatte "Novara" um die Erde in den Jahren 1857, 1858, 1859;

Zoologischer Theil, vol. 1 (Wirbelthiere) Fische, pp. 1-433, pls. 1-16, 1865.

Of the entire list 42 are reported from Tahiti. Several of these, like *Etroplus maculatus, Ophicephalus punctatus, Anabas scandens* and *Scatophagus argus* are erroneous. Doubtless they were procured in the Indian region (unless introductions?) *Holocentrus tahiticum* indicated as new was described in a previous paper and falls as a synonym of *Holocentrus sammara* (Forskål).

KNER, RUDOLF, Neue Fische aus dem Museum der Herren Joh. C. Godeffroy und Sohn in Hamburg: Akad. Wiss. Wien, Sitz., vol. 54, pt. 1, pp. 356-395, pls. 1-5, 1866.

Of 30 species listed 14 are from Oceania, mostly Samoa. Of these 12 are described as new, though only 3 are valid.

KNER, RUDOLF, Uber neue Fische aus dem Museum der Herren Johann Casar Godeffroy und Sohn in Hamburg: Akad. Wiss. Wien, Sitz., vol. 58, pt. 1, pp. 26-31, 1868.

Of the 27 species listed, 15 are described as new from Oceania. Of these, 7 are synonyms.

KNER, RUDOLF, Folge neuer Fische aus dem Museum der Herren. Joh. Cas. Godeffroy und Sohn in Hamburg: Akad. Wiss. Wien, Sitz., vol. 58, pt. 1, pp. 293-356, pls. 1-9, 1868.

Describes 40 species, largely an elaboration of the work just preceding. Of the species described, 4 are new, though 2 are synonyms.

KNER, RUDOLF, 1870. (See Steindachner and Kner.)

LAY, GEORGE, and BENNETT, E. T., Capt. F. W. Beechey's voyage in the ship "Blossom" to the Pacific and Bering Straits in 1825 to 1828, Fishes, pp. 41-75, pls. 15-23, 1839.

Lists 10 species from Oceania. Of 9 described as new, 3 are valid. Gill states that "the 'naturalist' of the expedition was, however, incompetent for the task, and the notes taken evince that he was not sufficiently versed in the rudiments of ichthyology to know what to observe." The figures are, however, fairly good for the time.

LESSON, R. P., Diacope macolor sp. nov.: Sci. Nat. Ferussac, Bull., vol. 12, p. 138, 1827.

This species is a synonym of *Lutjanus niger* (Forskål).

LESSON, R. P., Description du nouveau genre ichthyophis et de plusiers espèces inédites ou peu connues de poissons, recueillis dans le voyage autour du monde de "La Coquille": Soc. Nat. Hist. Paris, Mem., vol. 4, pp. 397-412, 1828.

Of 5 species described as new from Oceania only *Ichthyophis tigrinus* is valid.

LESSON, R. P., Voyage autour du monde, Exécuté par Ordre du Roi, Sur la Corvette de Sa Majesté, "La Coquille," pendant les années 1822, 1823, 1824 et 1825: par M. L. I. Duperrey: Zoologie, vol. 2, pt. 1, Chap. X. Poissons, pp. 66-238, pls., 1830.

Of the 114 species listed 73 are from Oceania, 35 are described as new, including 27 synonyms. The publication date is given by Sherborn for volume 2, part 1, pp. 25-240 according to Bibl. Franc. as November 12, 1831.

LICHTENSTEIN, HEINRICH, Descriptiones animalium quae in itinere ad maris australis terras per annos 1772, 1773 et 1774 suscepto collegit observavit et delineavit Ioannes Reinoldus Forster, 1844.

References to fishes in Oceania are: Society Islands, pp. 181-201, 212-229, 230-237; Tanna Island, New Hebrides, pp. 256-57; New Caledonia, p. 257; between New Caledonia and Norfolk Island, pp. 282-301. Altogether 63 species are described.

MACDONALD, J. D., On the character of the type of a proposed new genus of Mugilidae inhabiting the fresh waters of Viti Levu, Fiji group; with a brief account of the native mode of capturing it: Zool. Soc. London, Proc., pp. 38-40, 1869.

Describes *Gonostomyxus loa-loa,* a synonym of *Cestraeus plicatilis* Valenciennes.

MACLEAY, WILLIAM, 1877. (See Alleyne and Macleay.)

MACLEAY, WILLIAM, Notes on some fishes from the Solomon Islands: Linn. Soc. New South Wales, Proc., vol. 4, pp. 60-64, 1880.

Lists 15 species.

MACLEAY, WILLIAM, Contribution to a knowledge of the fishes of New Guinea: New Zealand Jour. Sci., vol. 1, p. 239, 1882.

Eight new species named, not described.

MACLEAY, WILLIAM, Contribution to a knowledge of the fishes of New Guinea: Linn. Soc. New South Wales, Proc., vol. 7, no. 1, pp. 224-250; no. 2, pp. 351-366, 1883; no. 3, pp. 585-598, 1883; no. 4, pp. 252-280, 1884.

These papers include a grand total of 405 species, 57 of which are described as new, though 42 are synonyms.

MACLEAY, WILLIAM, On a new and remarkable fish of the family Mugilidae from the interior of New Guinea: Linn. Soc. New South Wales, Proc., vol. 8, pp. 2-6, 2 figs., 1884.

The species *Aeschrichthys goldiei* described.

METZ, C. W., 1912. (See Jordan and Metz.)

MEYER, A. B., Catálogo de los peces recolectados en el Archipélago de las Indias Orientales durante los años 1870 á 1873: Soc. Española Hist. Nat. Madrid, Anales, vol. 14, pp. 1-49, 1885.

Includes records for 42 species from Rubi, New Guinea.

MOHR, ERNA, 1925, 1926. (See Duncker and Mohr.)

MOHR, ERNA, Die Gattung Zenarchopterus Gill: Zool. Jahrbücher, vol. 52, pp. 231-266, figs. 1-21, 1926.

A descriptive account of materials in the Hamburg Museum. *Zenarchopterus dunckeri* new name.

MOHR, ERNA, Mugiliden-Studien: Zool. Jahrbücher, vol. 54, pp. 177-202, figs. 1-18, 1927.

Chiefly of interest in discussion of genera.

MONTROUZIER (REV. PÈRE) XAVIER, Essai sur la faune de l'ile de Woodlark ou Moiou, pp. 1-222; ichthyologie, pp. 139-222, Lyon, 1857.

Includes descriptions of 127 species, of which 67 are manuscript names, some duplicated. See also Thiollière.

NICHOLS, J. T., A Hawaiian race of Carangoides gymnostethoides: Am. Mus. Novit., no. 3, pp. 1 and 2, fig. 1, March 9, 1921.

Describes *Carangoides gymnostethoides evermanni.*

NICHOLS, J. T., Carangoides jordani from the Hawaiian islands with notes on related fishes: Am. Mus. Novit., no. 50, pp. 1-3, October 24, 1922.

NICHOLS, J. T., Two new fishes from the Pacific Ocean: Am. Mus. Novit., no. 94, pp. 1-3, figs. 1-2, October 19, 1923.

Describes *Phaethonichthys tuberculatus* and *Clupeolabrus dubius* as new genera and species, but both are synonyms.

OGILBY, J. D., 1886. (See Ramsay and Ogilby.)

OGILBY, J. D., Report on a collection from the Solomon Islands, Pisces: Australian Mus., Records, vol. 1, p. 7, 1890.

Six species listed.

OGILBY, J. D., Report on a collection from the Solomon Islands, Pisces: Australian Mus., Records, vol. 1, p. 101, 1891.

Four species listed only as genera.

OGILBY, J. D., Digest of a report on a collection of reptiles, batrachians and fishes, forwarded from St. Joseph River, by Sir William MacGregor, Administrator of British New Guinea: British New Guinea, Ann. Rept., 1889-1890, appendix W., p. 116, 1891.

OGILBY, J. D., Report of a zoological collection from British New Guinea; 1, Reptiles, Batrachians and Fishes: Australian Mus., Records, vol. 1, 1890, p. 89, 1891.

OGILBY, J. D., Contribution to a knowledge of the fauna of British New Guinea; Pisces: Linn. Soc. New South Wales, Proc., 2nd ser., vol. 13, p. 363, 1898.

Records 7 species of fresh water fishes.

PELLEGRIN, JACQUES, Contribution à l'etude ichthyologique des ilss Mariannes, d'apres les envois de M. Marche: Mus. Hist. Nat. Paris, Bull., vol. 4, pp. 228-229, 1898.

List of 47 species.

PELLEGRIN, JACQUES, Sur une collection de poissons des Nouvelles-Hebrides du Dr. Cailott: Mus. Hist. Nat. Paris, Bull., vol. 18, no. 4, pp. 205-207, 1912.

List of 23 species, including redescription of type of *Callechelys guichenoti* Kaup.

PERUGIA, ALBERTO, Viaggio di Lamberto Loria nella Papuasia orientale; Pesci d'acqua doce: Mus. Civ. Stor. Nat. Genova, Ann., 2nd ser., vol. 14, pp. 546-553, 1894.

Nine species listed, 2 as new, both valid.

PETERS, W. C. H., Ubersicht der während der von 1874 bis 1876 unter dem Commando des Hrn. Capitän z. S. Freiherrn von Schleinitz ausgeführten Reise S. M. S. "Gazelle" gesammelten und von der Kaiserlichen Admiralität der Königlichen Akademie der Wissenschaften übersandten Fische: Akad. Wiss. Berlin, Monatsb., pp. 831-854, 1876.

A list of 184 species of which 123 are from Oceania. Of 10 described as new 5 are synonyms.

QUOY, J. R. C., and GAIMARD, J. P., Voyage autour du monde, Entrepris par Ordre du Roi, exécuté sur les corvettes de "S. M. l'Uranie" et al "Physicienne," pen-

dant les annes 1817, 1818, 1819 et 1820, par M. Louis de Freycinct: Zoologie, Poissons, pp. 183-401, pls., 1824. The dates of publication are as follows: pp. 129-184, September 18, 1824; pp. 185-232, October 9, 1824; pp. 233-280, November 20, 1824; pp. 281-328, December 18, 1824; pp. 329-424, January 29-May 26, 1825.

Of species pertaining to Oceania 73 are described as new, of which 39 are valid, though 2 doubtfully so.

RADCLIFFE, LEWIS, 1912. (See Kendall and Radcliffe.)

RAMSAY, E. P., and OGILBY, J. D., A contribution to the knowledge of the fish-fauna of New Guinea: Linn. Soc. New South Wales, Proc., 2nd ser., vol. 1, pp. 8-20, 1886.

List of 25 species. Of 12 described as new, 2 are synonyms.

REGAN, C. T., Descriptions of four new fresh-water fishes from British New Guinea: Ann. Mag. Nat. Hist. London, ser. 1, vol. 8, pp. 153-156, 1908.

REGAN, C. T., A collection of fishes made by Professor Francisco Fuentes at Easter Island: Zool. Soc. London, Proc., pp. 368-374, pls. 55-60.

List of 11 species, of which 4 described as new, though 2 are synonyms.

REGAN, C. T., Report on the freshwater fishes collected by the British Ornithologists' Union Expedition and the Wollaston Exped. in Dutch New Guinea: Zool. Soc. London, Trans., vol. 20, pt. 6, pp. 275-284, pl. 31, 1914.

A revision of the Melanotaeniine Atherinidae, in which 5 new genera and 1 new species described.

REGAN, C. T., A young swordfish (Xiphias gladius), with a note on Clupeolabrus: Ann. Mag. Nat. Hist. London, ser. 9, vol. 13, p. 224, fig., 1924.

SAUVAGE, H. E., 1875. (See Vaillant and Sauvage.)

SCHMELTZ, J. D. E., Museum Godeffroy, Cat. 4, 1869; Cat. 5, 1874; Cat. 6, 1877.

In Cat. 5, pp. 12-29 is a sales list, "Herr Prof. Kner für Fische," with localities; addenda p. 132. In Cat. 5, pp. 21-41, is a list with localities; addenda pp. 203-207. In Cat. 6, pp. 11-18, is a sales list. These three catalogs are all I have consulted though evidently three others were issued previously. They are of use in the records for certain localities in Oceania, the materials evidently having been determined by Kner and others. Upward of 500 species are recorded in each catalog for Oceania besides many others extralimital.

SEALE, ALVIN, Report of a Mission to Guam, pt. 2, Fishes: B. P. Bishop Mus., Occ. Papers, vol. 1, no. 3, 1900, pp. 61-128, 1901.

Descriptions of 142 species. All of the 20 indicated as new are synonyms of known species.

SEALE, ALVIN, New Hawaiian fishes: B. P. Bishop Mus., Occ. Papers, vol 1, no. 4, pp. 3-13, figs. 1-6, 1901.

Of 5 species described as new, 1 is valid.

SEALE, ALVIN, Fishes of the South Pacific: B. P. Bishop Mus., Occ. Papers, vol. 4, no. 1, pp. 1-89, figs. 1-23, 1906.

An annotated list of 350 species is given with descriptions of 33, "which seem to be new to science," though only *Salarias caesius* appears tenable. It had been previously described, however, though wrongly named. Some of the illustrations, photographed from alcoholic specimens, are of little value.

SILVESTER, C. F., 1922. (See Fowler and Silvester.)

SMITH, ROSA, and SWAIN, JOSEPH, Notes on a collection of fishes from Johnston's Island, including descriptions of five new species: U. S. Nat. Mus., Proc., vol. 5, pp. 119-143, 1882.

An annotated list of 27 species. The 5 species indicated as new are synonyms of known species.

SNYDER, J. O., A catalogue of the shore fishes collected by the steamer "Albatross" about the Hawaiian islands in 1902: U. S. Fish Comm., Bull., vol. 22, 1902, pp. 513-538, pls. 1-13, January 19, 1904.

An annotated list of 227 species. Of 25 described as new, 14 are synonyms.

SNYDER, J. O., 1904, 1905, 1907. (See Jordan and Snyder.)

SOULEYET, F. L. A., 1842. (See Eydoux and Souleyet.)

STEINDACHNER, FRANZ, and KNER, RUDOLF, Ueber einige Pleuronectiden, Salmoniden, Gadoiden und Blenniiden aus der Decastris-Bay und von Viti-Levu: Akad. Wiss. Wien, Sitz., vol. 61, pt. 1, pp. 421-446, pls., 1870.

Of the 2 species described as new, only *Solea nigrostriolata* is valid.

STEINDACHNER, FRANZ, Fische aus dem Stillen Ocean. Ergebnisse einer Reise nach dem Pacific (Schauinsland 1896-1897): Akad. Wiss. Wein, Denks., vol. 70, pp. 316-318, 483-521, pls. 1-6, 1901.

A list of 134 species from Oceania, largely Hawaiian. Of 9 described as new 5 are synonyms.

STEINDACHNER, FRANZ, Ueber eine neue Gattung und art aus der Familie der Muraenidae, Nettastomops barbatula: Akad. Wiss. Wien, Anz., vol. 43, pp. 299-300, 1906.

A synonym of *Rhinomuraena quaesita* Garman.

STEINDACHNER, FRANZ, Zur Fischfauna der Samoa-Inseln: Akad. Wiss. Wien, Sitz., vol. 115, pt. 1, pp. 1369-1425, July 1906.

A list of 178 species from Samoa. Of 7 described as new 4 are synonyms.

STREETS, T. H., Contributions to the natural history of the Hawaiian and Fanning islands and Lower California, made in connection with the United North Pacific Expedition 1873-1875: U. S. Nat. Mus., Bull., no. 7, pp. 1-172; Ichthyology, pp. 43-102, 1877.

From Hawaii a list of 39 species and a new variety of *Hepatus triostegus*. From Fanning 36 species listed with 3 described as new, 1 of which is a synonym. From Samoa 20 species listed, obtained by A. B. Steinberger. One described as new is invalid.

THIOLLIÈRE, V. J., ["Le membre de la Commission de publication chargé de la revision de l'ichthyologie de Woodlark, en l'absence de l'auteur."] Essai faune de l'ile de Woodlark ou Moiou, par le P. Montrouzier, pp. 138-222, Lyon, 1857. (See also Montrouzier.)

Of the 127 species 75 are indicated as new by Thiollière. Many of these are so imperfectly described as to give little clue as to their relationships. In the present work all of them are admitted as synonymic references only.

SWAIN, JOSEPH, 1882. (See Smith and Swain.)

VAILLANT, LEON, and SAUVAGE, H. E., Note sur quelque espèces nouvelles de poissons des iles Sandwich: Rev. Mag. Zool., 3rd ser., vol. 3, pp. 278-287, 1875.

Describes 18 Hawaiian fishes as new, 10 of which are synonyms.

VAILLANT, LEON, Matériaux pour servir à l'historie ichthyologique des archipels de la Societé et des Pomotous: Soc. Philom. Paris, Bull., ser. 7, vol. 11, pp. 49-62, 1887.

A list of 24 species.

VAILLANT, LEON, Sur un nouveau genre de poissons, voisin des Fierasfer: Acad. Sci. Paris. Compt. Rend., vol. 117, pp. 745-746, 1893.

Rhizoiketicus carolinensis described.

WAITE, E. R., The mammals, reptiles and fishes of Funafuti: Australian Mus., Mem., vol. 3, pp. [165-201] 181-201, 1897.

Includes notices of 54 species of fishes.

WAITE, E. R., The fishes of Funafuti, Supplement: Australian Mus., Mem., vol. 5, pt. 9, pp. 537-546, fig., 1899.

Seven species noticed.

WAITE, E. R., Notes on zoology of Paanopa or Ocean Island and Naura or Pleasant Island, Gilbert Group; The Fishes: Australian Mus., Records, vol. 5, no. 1, pp. 2-3, 1903.

A list of 14 species from Nauru and 12 species from Paanopa.

WEBER, MAX [CARL WILHELM], Fische von Ambon, Java, Thursday Island, dem Burnett-Fluss und von der Süd-Küste von Neu-Guinea: Zool. Forschungsr. Australian Malay. Arch.: Ritter-Semon, vol. 5, pp. 257-276, fig., 1895.

Twelve species listed from the coast of New Guinea.

WEBER, MAX [CARL WILHELM], De fischfauna van Nieuw-Guinea: Akad. Wet. Amsterdam, Wiss., Nat. Afd., Verslagen, vol. 15, pp. 368-372, 1906.

A general discussion of faunal relations.

WEBER, MAX [CARL WILHELM], Süsswasserfische von Neu-Guinea: Nova Guinea, vol. 5, Zool. pt. 2, pp. 201-267, 3 pls., 1908.

A descriptive account in which 66 species are noticed with a bibliography. Of 22 described as new 7 are synonyms.

WEBER, MAX [CARL WILHELM], Visschen van Nieuw Guinea: Ned. Dierk. Ver. Tijds., 2nd ser., vol. 10, p. xxxiv, 1908.

Note on the distribution of New Guinea fishes.

WEBER, MAX [CARL WILHELM], Neue Fische aus niederländisch Süd Neu-Guinea: Leyden Mus., Notes, vol. 32, pp. 225-230, pl., 1910.

Lists 9 species. Of the 8 described as new, 3 are synonyms.

WEBER, MAX [CARL WILHELM], Süsswasserfische aus niederländisch süd und nord neu-Guinea: Nova Guinea, vol. 9, Zool., book 4, pp. 513-613, pls. 12-14, 1913.

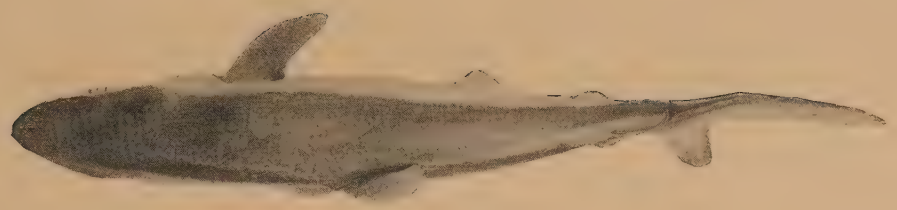
A descriptive account of 105 fresh-water species from New Guinea. Of 17 described as new, all but one are valid.

WEBER, MAX [CARL WILHELM], and BEAUFORT, L. F. DE, The Fishes of the Indo-Australian Archipelago: vol. 1, 410 pp., 2 figs., 1911; vol. 2, Malacopterygii Myctophoidea, Ostariophysi: I, Siluroidea, 404 pp., 151 figs., 1913; vol. 3, Ostariophysi: II, Cyprinoidea, Apodes, Synbranchii, 455 pp., 214 figs., 1916; vol. 4, Heteromi, Solenichthys, Synentognathi, Percesoces, Labyrinthici, Microcyprini, 409 pp., 103 figs., 1922.

WEBER, MAX [CARL WILHELM], and BEAUFORT, L. F. DE, Ueber neue Fische von Neu-Kaledonien: Zool. Anzieger, vol. 42, pp. 172-174, 1913.
Describes *Galaxias neocaledonicus.*

WEBER, MAX [CARL WILHELM], and BEAUFORT, L. F. DE, Les Poissons d'eau douce de la Nouvelle-Caledonia (Sarasin and Roux) pp. 1-41, figs. 1-3, 1915.
Lists 30 species and describes *Sicyopterus sarasini.*

WHITLEY, GILBERT P., A check-list of fishes recorded from Fijian waters: Pan-Pacific Research Institution, Jour., vol. 2, no. 1, pp. 3-8, Jan.-March 1927.
A list of 439 nominal species.



A

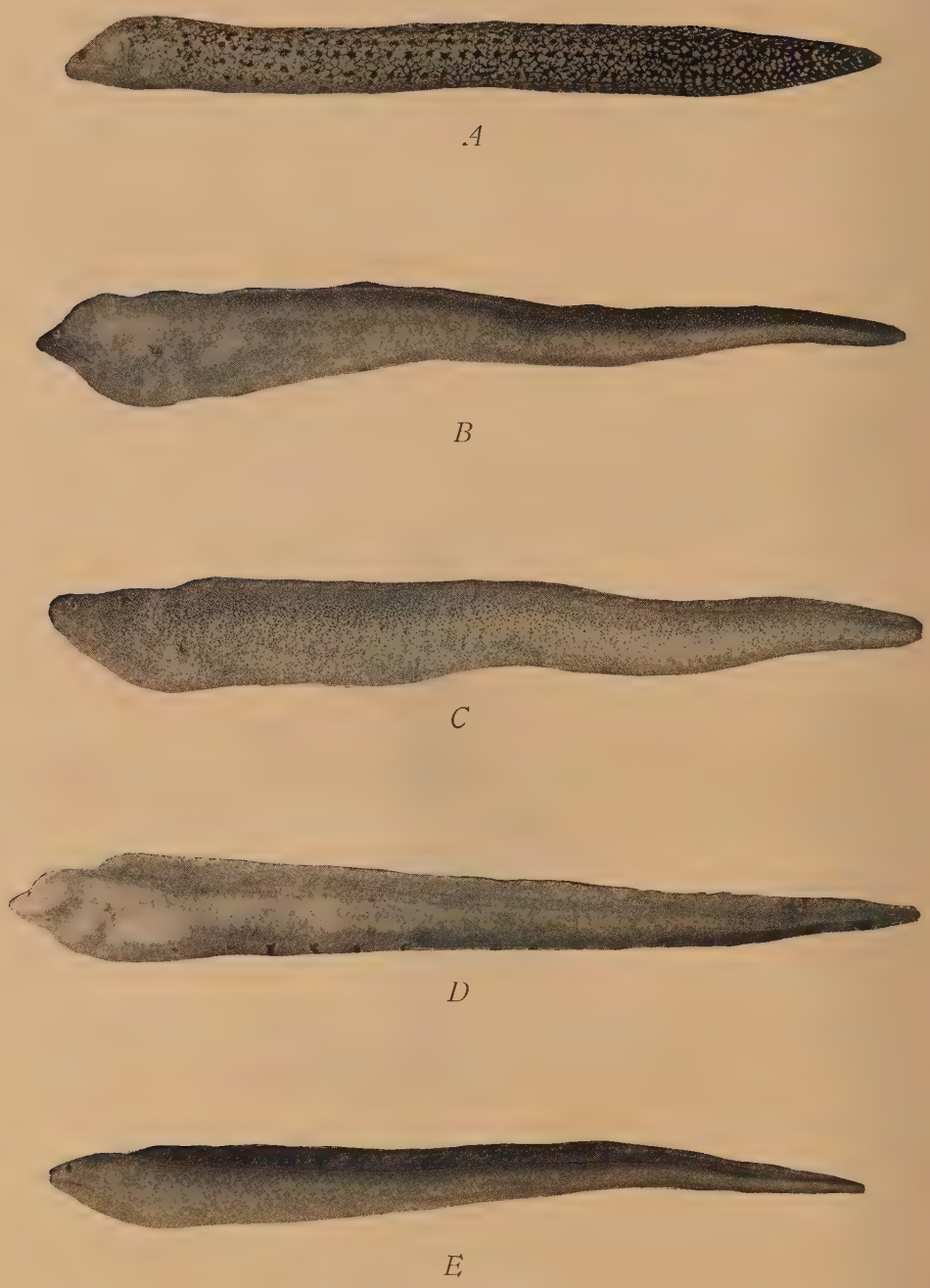
B

C

D

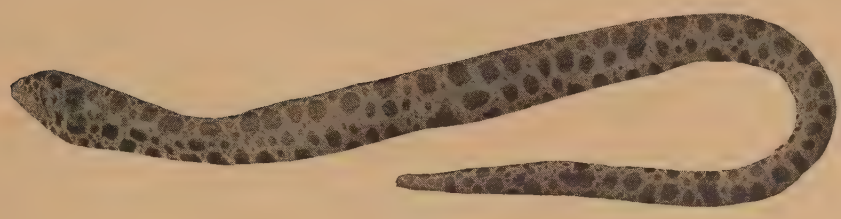
E

A, EULAMIA SORRAH; *B*, CHANOS CHANOS; *C*, CONGER WILSONI; *D*, CONGER BOWERSI; *E*, ECHIDNA ZEBRA.



A, LYCODONTIS MELEAGRIS; *B*, LYCODONTIS TILE; *C*, LYCODONTIS FLAVOMARGINATA; *D*, LYCODONTIS RICHARDSONII; *E*, LYCODONTIS HEPATICA.

A



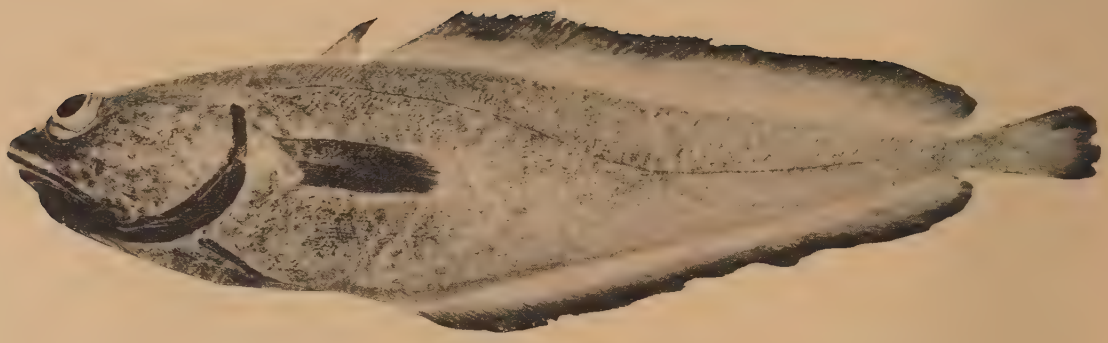
B

C

D

E

A, ENCHELYNASSA CANINA; B, UROPTERYGIUS TIGRINUS; C, TRACHINOCEPHALUS MYOPS; D, STRONGYLURA INDICA; E, ABLENNES HIANS.



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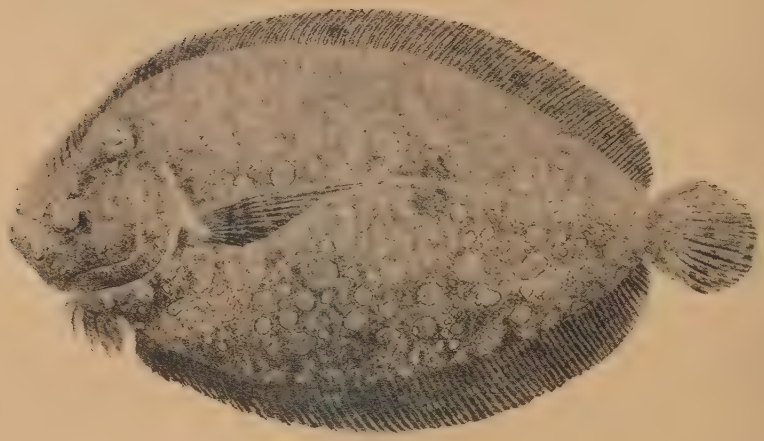

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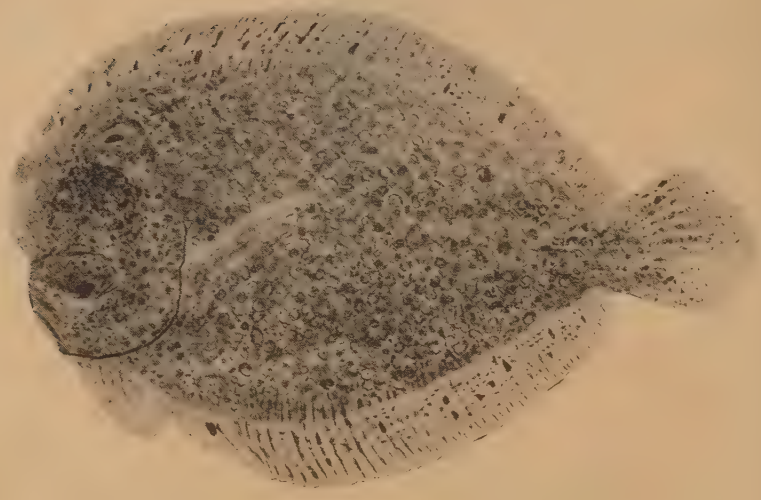

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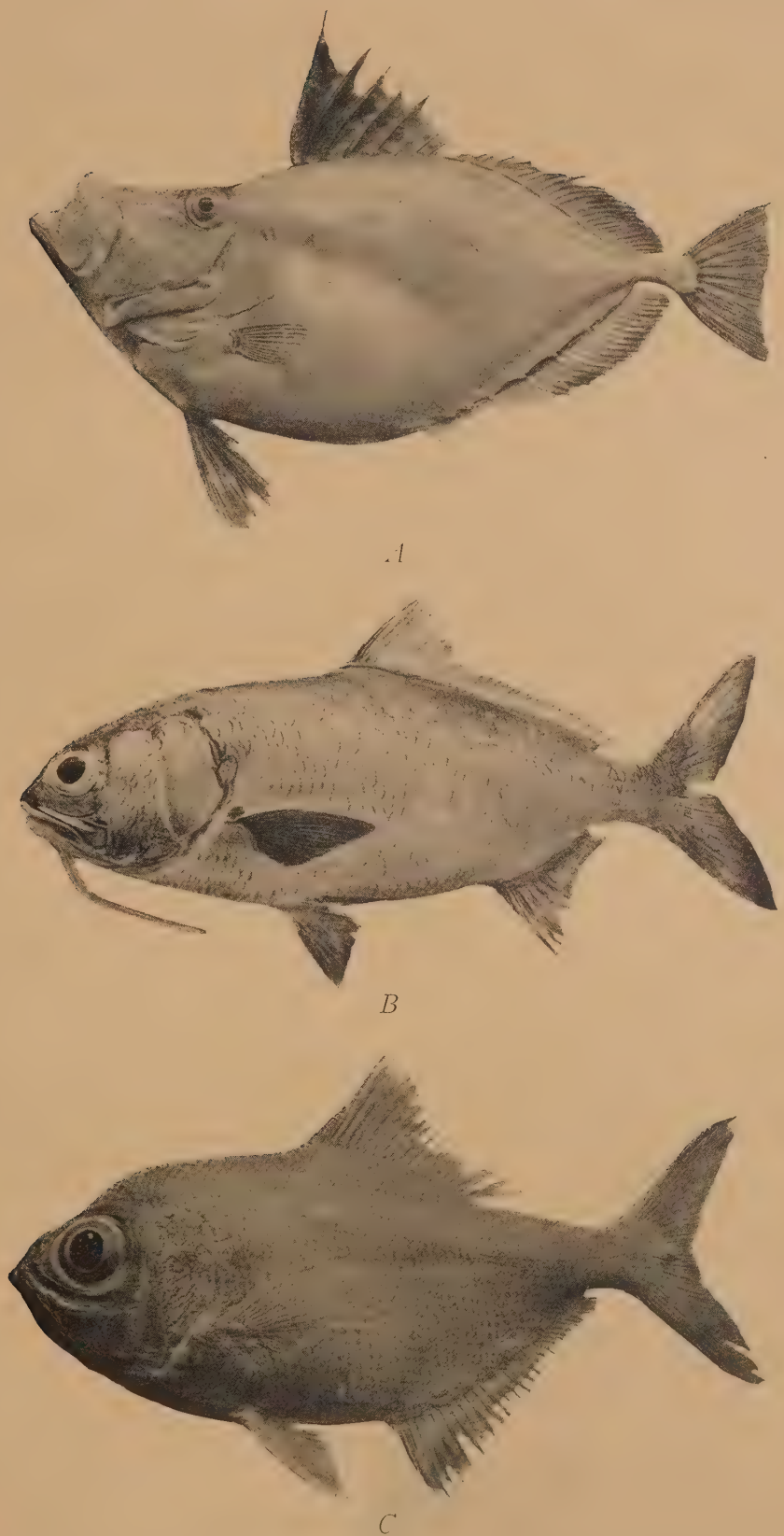
A, PHYSICULUS KAUPI; *B*, PLATOPHRYS MANCUS; *C*, PLATOPHRYS THOMPSONI.



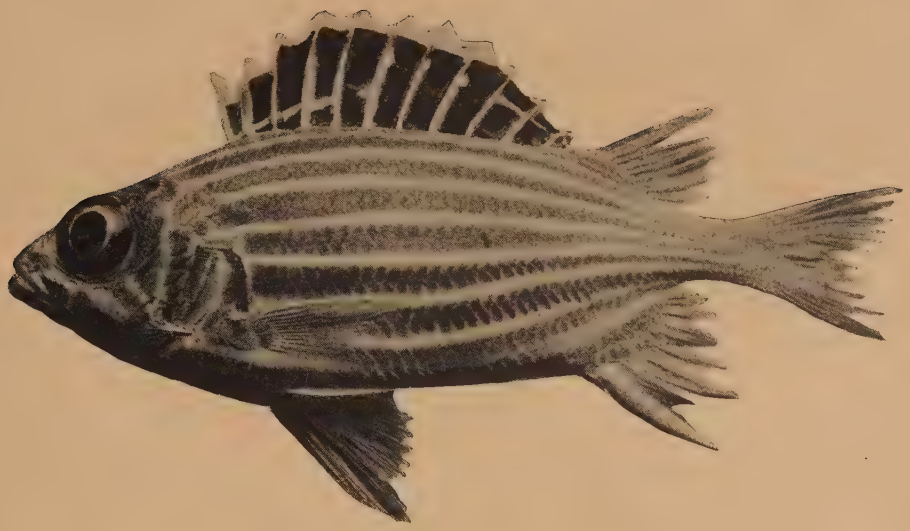
A, ZENOPSIS NEBULOSUS; *B*, POLYMIXIA JAPONICA; *C*, BERYX DECADACTYLUS.

A

B

C

A, OSTICHTHYS JAPONICUS; *B*, MYRIPRISTIS ADUSTUS; *C*, MYRIPRISTIS MULTIRADIATUS



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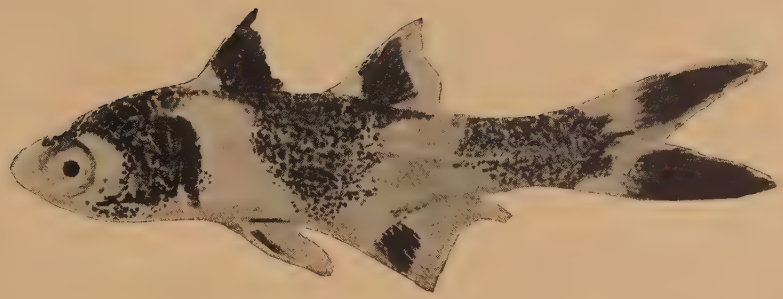


B

C

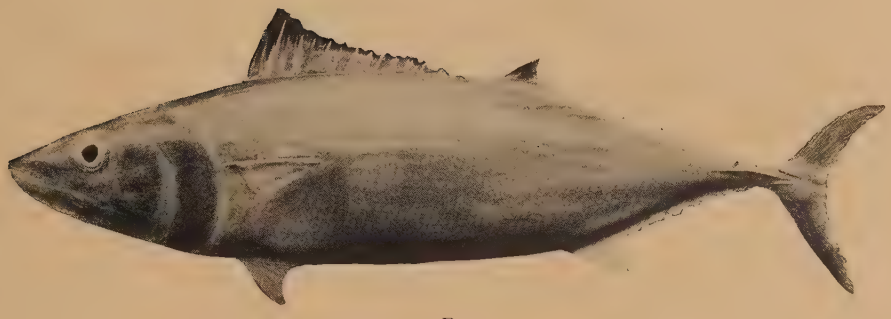
A, HOLOCENTRUS DIADEMA; *B*, POLYDACTYLUS SEXFILIS; *C*, SCOMBER JAPONICUS.

A

B

A, HIPPOCAMPUS KUDA; *B*, PARAPEGASUS NATANS.

A



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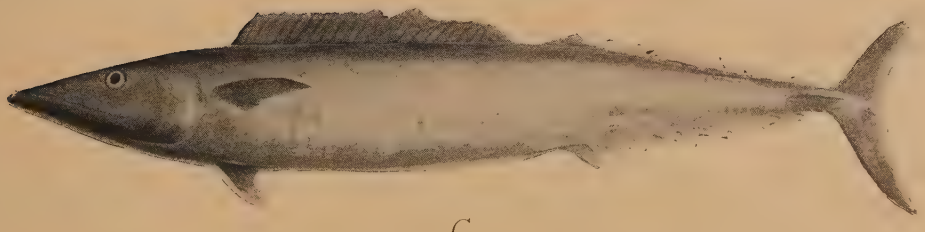

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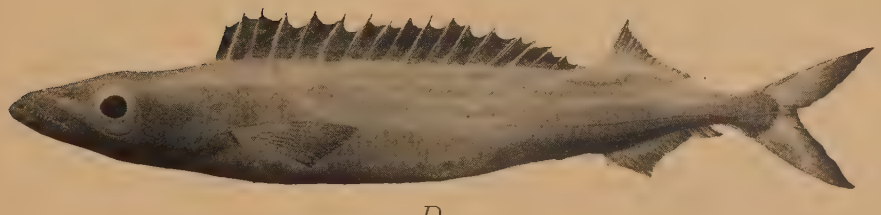


D

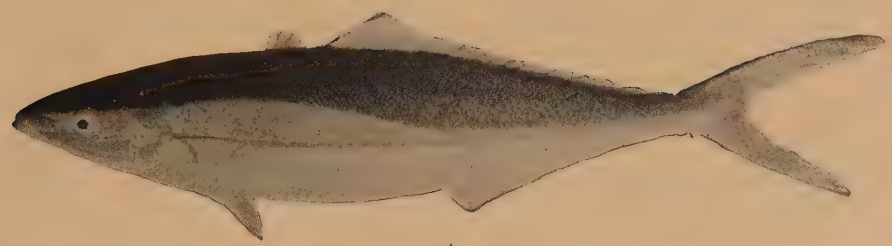
A, EUTHYNNUS ALLETTERATUS; *B*, SARDA CHILENSIS; *C*, ACANTHOCYBIUM SOLANDRI; *D*, PROMETHICHTHYS PROMETHEUS.

A

B

C

A, RUVETTUS PRETIOSUS; *B*, TARACTES STEINDACHNERI; *C*, SERIOLA PURPURASCENS.

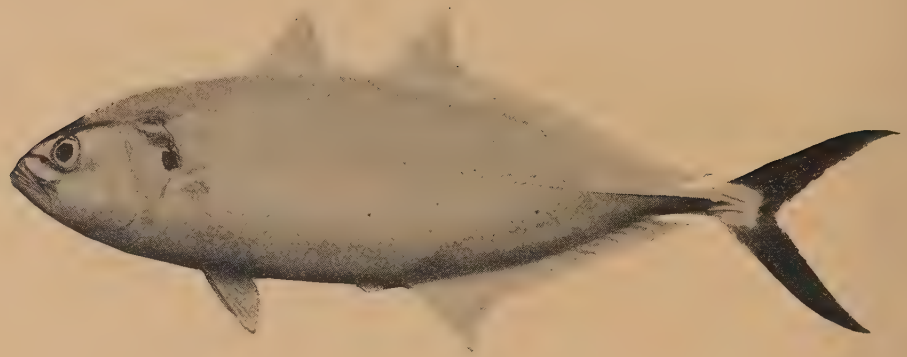


A

B

C

A, ELAGATIS BIPINNULATUS; *B*, DECAPTERUS SANCTAE-HELENAE;
C, GNATHANODON SPECIOSUS.



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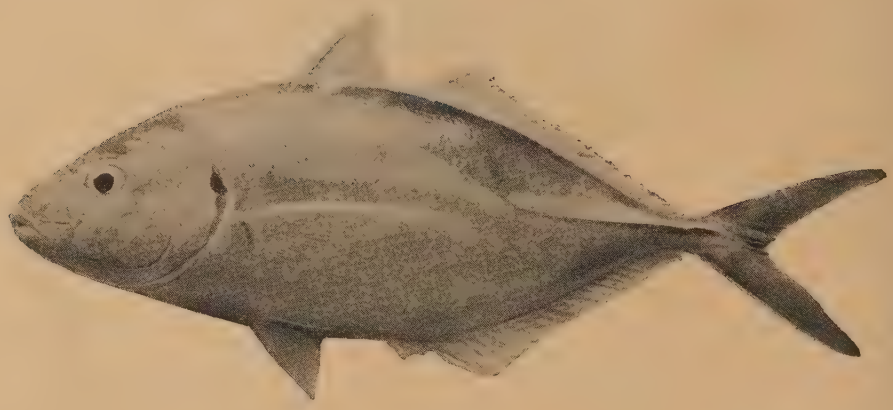


C

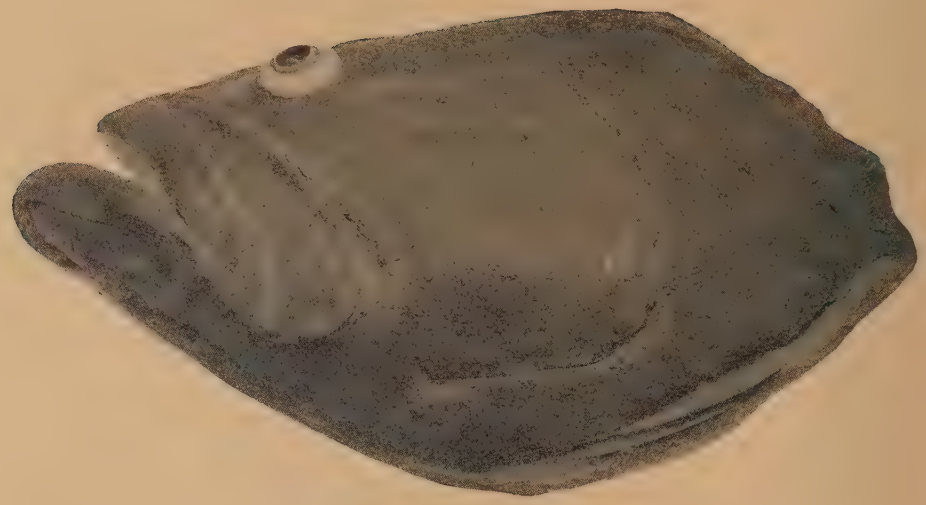
A, CARANX KUHLII; *B*, CARANX ASCENSIONIS; *C*, CARANX CHEILIO.

A

B

C

A, CARANX ELACATE; *B*, CARANX HELVOLUS; *C*, CARANX LUGUBRIS.



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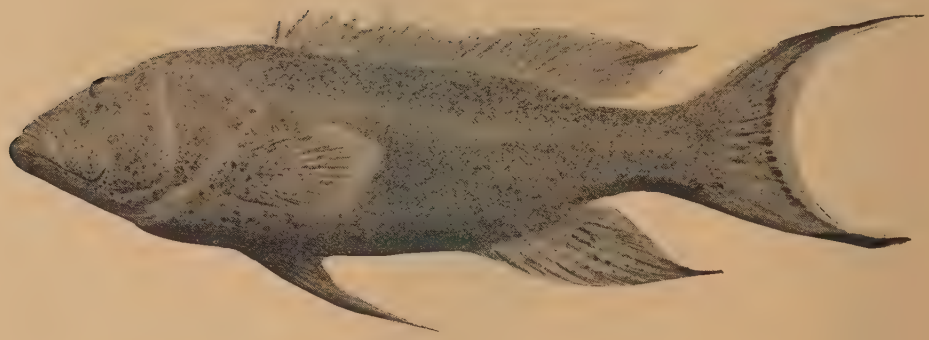

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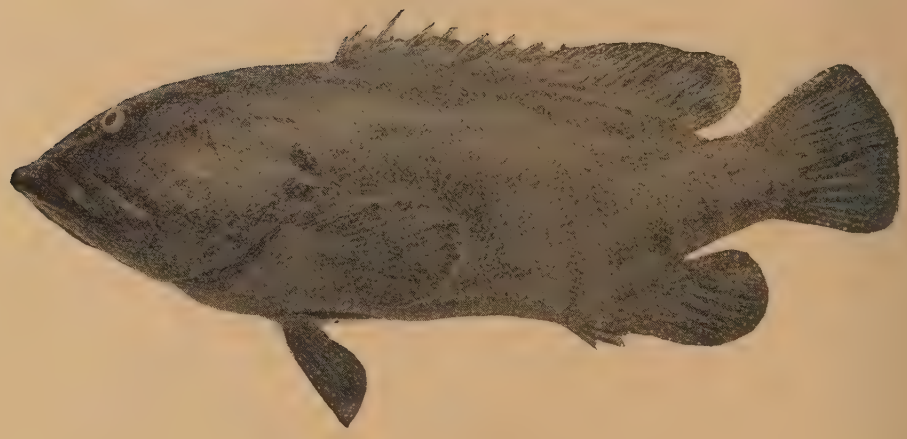


C

A, STÉRÉOLÉPOIDES THOMPSONI; *B*, VARIOLA LOUTI; *C*, CEPHALOPHOLIS ARGUS.

A

B

C

A, SERRANUS FUSCOGUTTATUS; *B*, CAPRODON LONGIMANUS; *C*, PRIACANTHUS BOOPS.

A

B

C

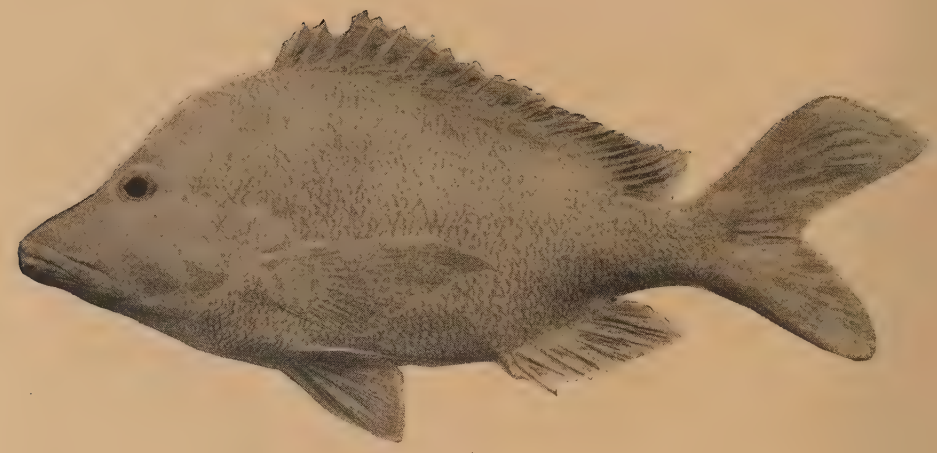
A, APSILUS ZONATUS; *B*, PRISTIPOMOIDES SIEBOLDII; *C*, APRION VIRESCENS.

A

B

C

A, ETELIS CARBUNCULUS; *B*, ETELIS MARSHI; *C*, KYPHOSUS FUSCUS.



A

B

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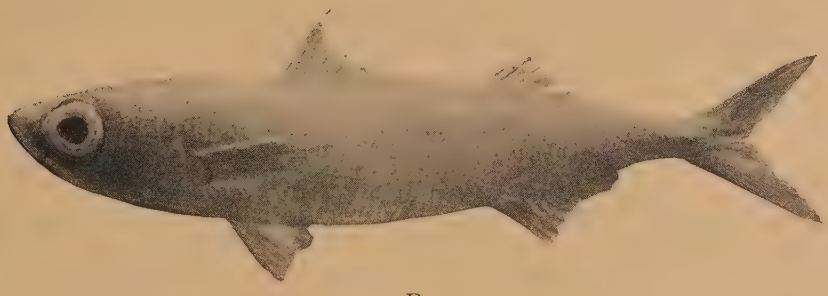
A



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A

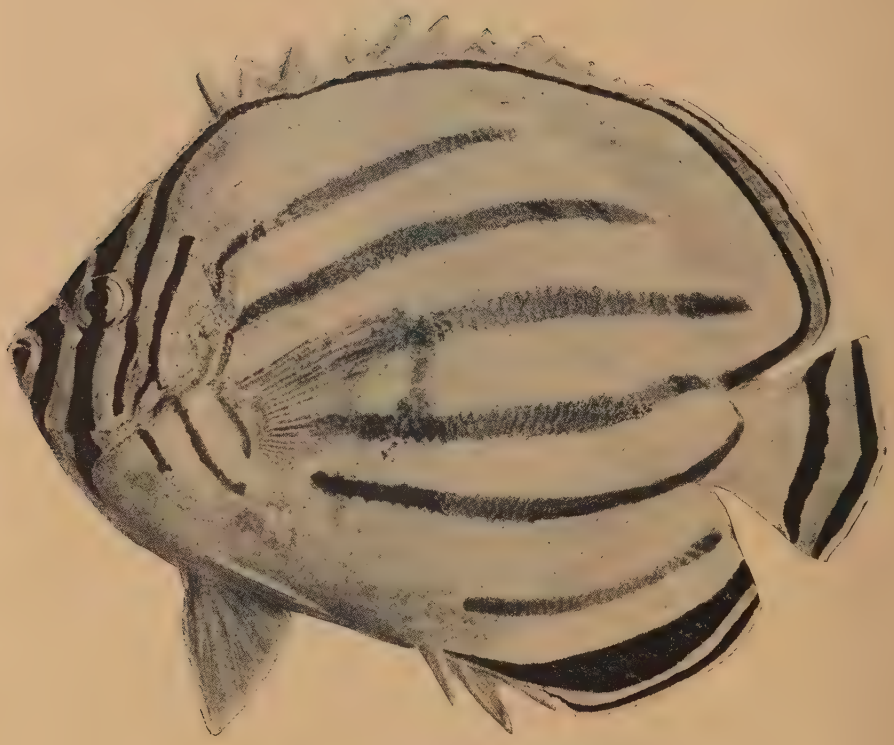
B

C

A, UPENEUS PORPHYREUS; *B*, UPENEUS MULTIFASCIATUS; *C*, UPENEUS PLEUROSTIGMA.

A, MULLOIDES AURIFLAMMA; *B*, MALACANTHUS HOEDTII; *C*, CHEILODACTYLUS VITTATUS.

A



B

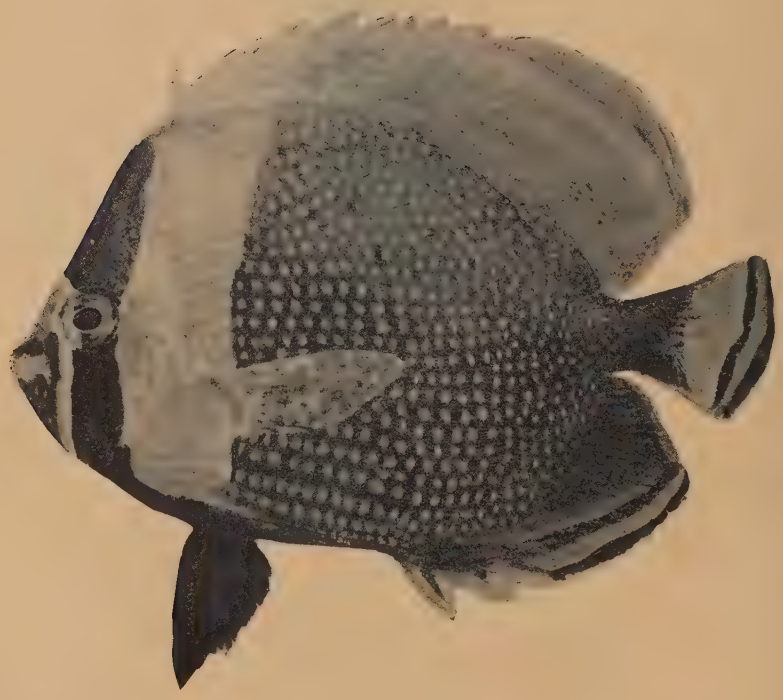
A, CIRRHITUS PINNULATUS; *B*, CHAETODON ORNATISSIMUS.

A

B

A, CHAETODON FREMBLII; *B*, CHAETODON TRIFASCIATUS.

A



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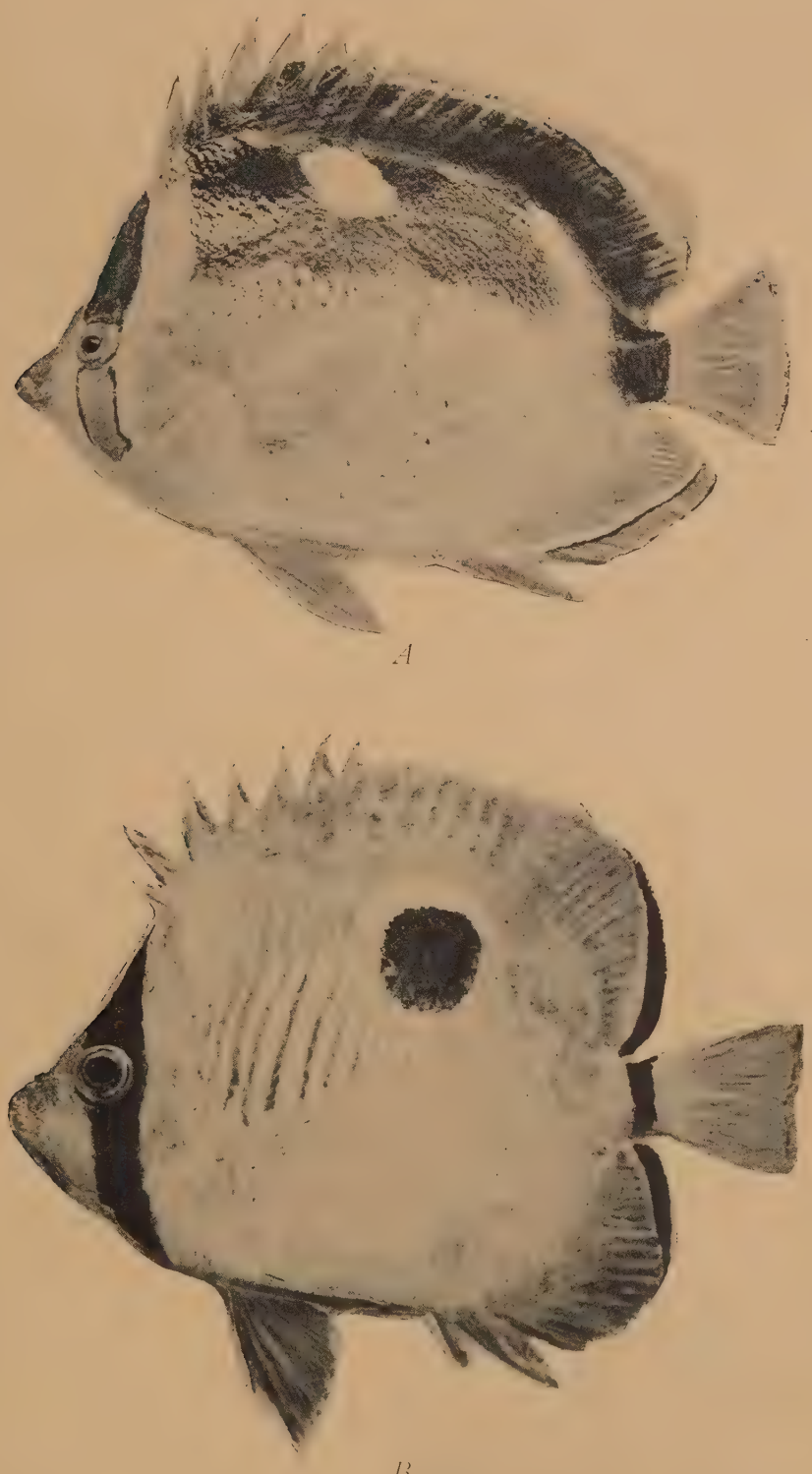

A

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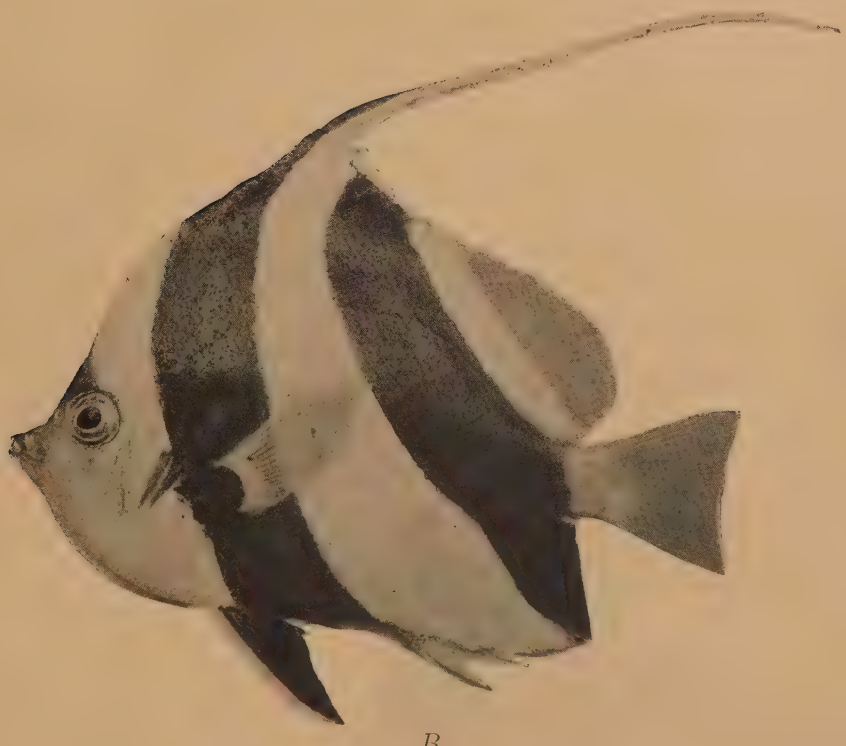
A, CHAETODON QUADRIMACULATUS; *B*, CHAETODON UNIMACULATUS.

A

B

A, CHAETODON SETIFER; *B*, CHAETODON LINEOLATUS.

A



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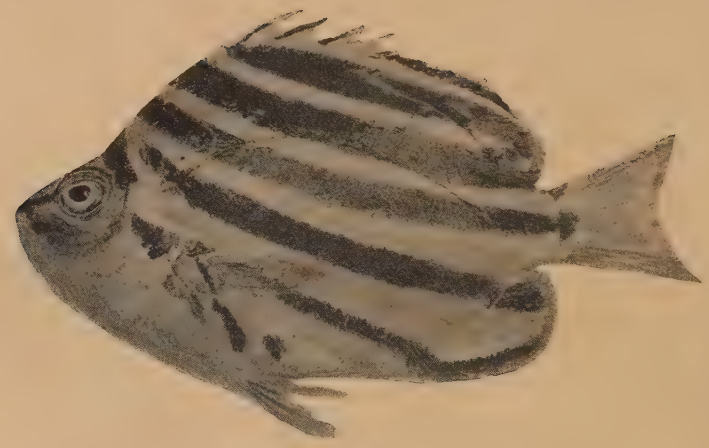


A

B

C

A, MICROCANTHUS STRIGATUS; *B*, FORCIPIGER LONGIROSTRIS; *C*, HOLACANTHUS ARCUATUS.

A

B

A, HOLACANTHUS POTTERI; *B*, ZANCLUS CANESCENS.

A

B

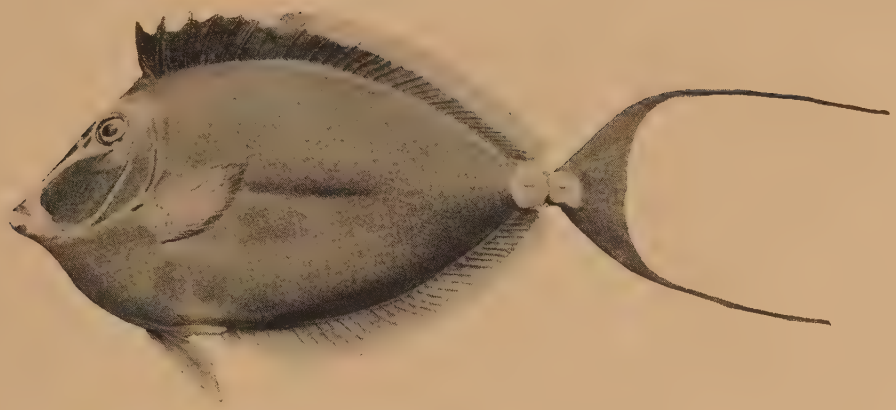
A, HEPATUS GUTTATUS; *B*, HEPATUS LEUCOPAREIUS.

A, HEPATUS TRIOSTEGUS; *B*, HEPATUS FULIGINOSUS; *C*, HEPATUS BARIENE.

A

B

A, zebrasoma flavescens; *B*, zebrasoma veliferum.



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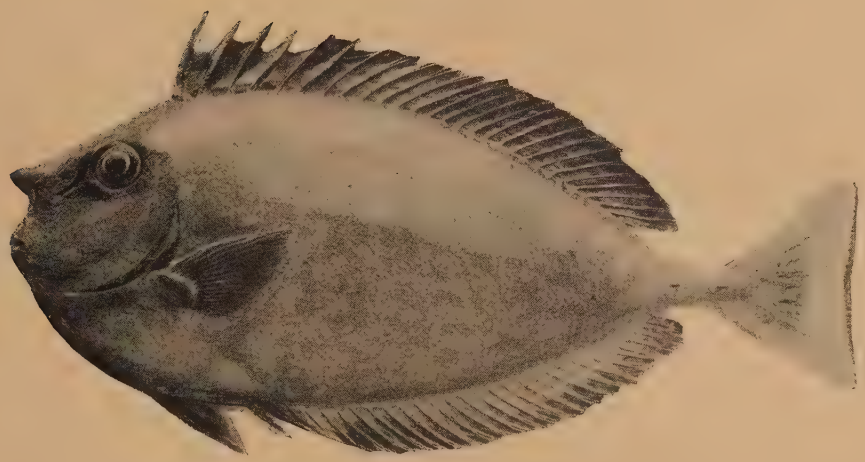

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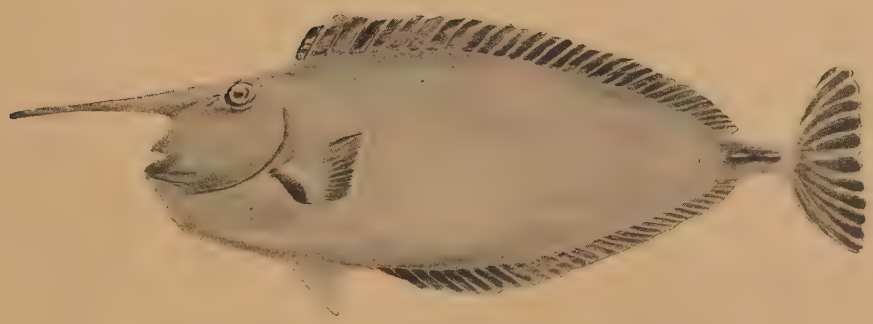


C

A, NASO LITURATUS; B, NASO ANNULATUS; C, NASO BREVIROSTRIS.

A

B

C

A, NASO HEXACANTHUS; *B*, SCORPAENOPSIS CACOPSIS; *C*, MERINTHE MACROCEPHALA.

A

B

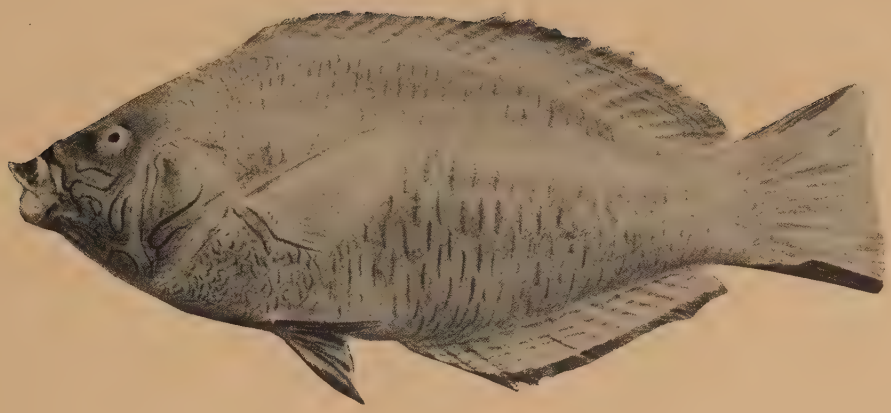
A, PTEROIS SPHEX; *B*, DACTYLOPTENA ORIENTALIS.

A

B

C

A, PERISTEDION ENGYCEROS; *B*, LEPIDAPLOIS MODESTUS; *C*, CHROMIS VERATER.



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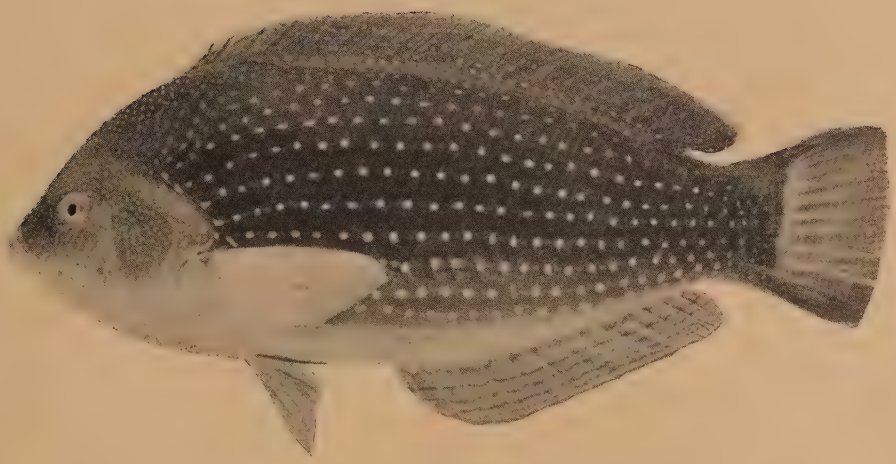


B

C

A, ANAMPSES GODEFFROYI; *B*, ANAMPSES CUVIER; *C*, HALICHOERES ORNATISSIMUS.

A

B

C

A, MACROPHARYNGODON GEOFFROY; *B*, CHEILINUS UNIFASCIATUS; *C*, CORIS BALLIEUI.

A

B

C

A, CORIS FLAVOVITTATA; *B*, CORIS GAIMARD; *C*, CORIS LEPOMIS.

A, B, C

A, THALASSOMA UMBROSTIGMA; *B,* THALASSOMA TRILOBATA; *C,* THALASSOMA BALLIEUI.

A

B

C

A, NOVACULICHTHYS TAENIOURUS; *B*, NOVACULICHTHYS BIFER; *C*, INIISTIUS NIGER.

A

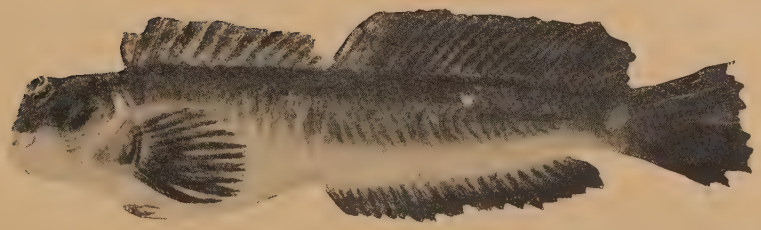
B

C

A, LEPTOSCARUS VAIGIENSIS; *B*, CALLYODON SORDIDUS; *C*, CHONOPHORUS GENIVITTATUS.

A

B



C

A, PARAPERCIS SCHAUINSLANDII; *B*, CIRRIPECTES BREVIS; *C*, SALARIAS ZEBRA.

A

B

C

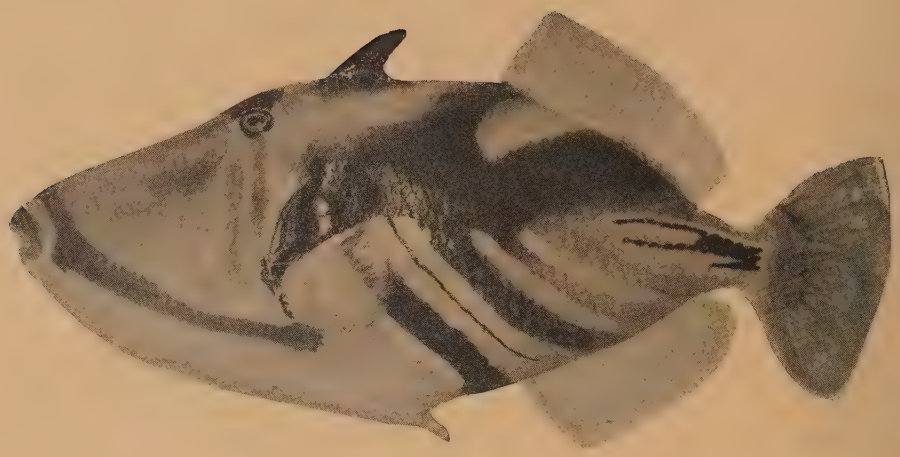
A, CANTHIDERMIS MACULATUS; *B*, BALISTES VIDUA; *C*, BALISTES CAPISTRATUS.

A

B

C

A, BALISTES BURSA; *B*, BALISTES RINGENS; *C*, BALISTES FUSCUS.



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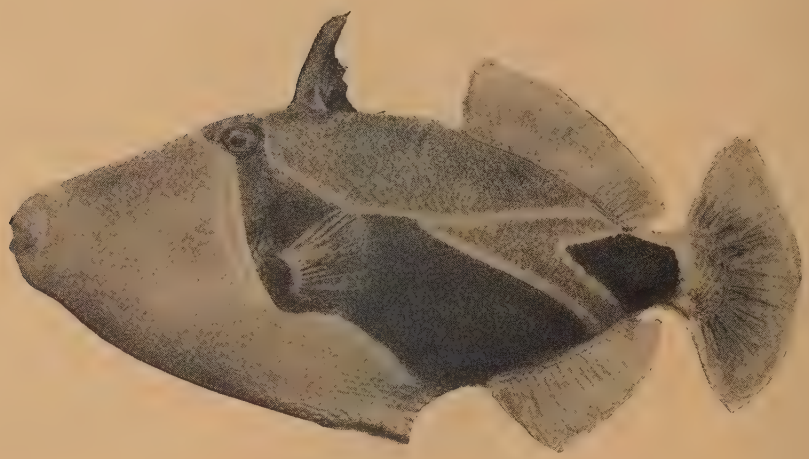

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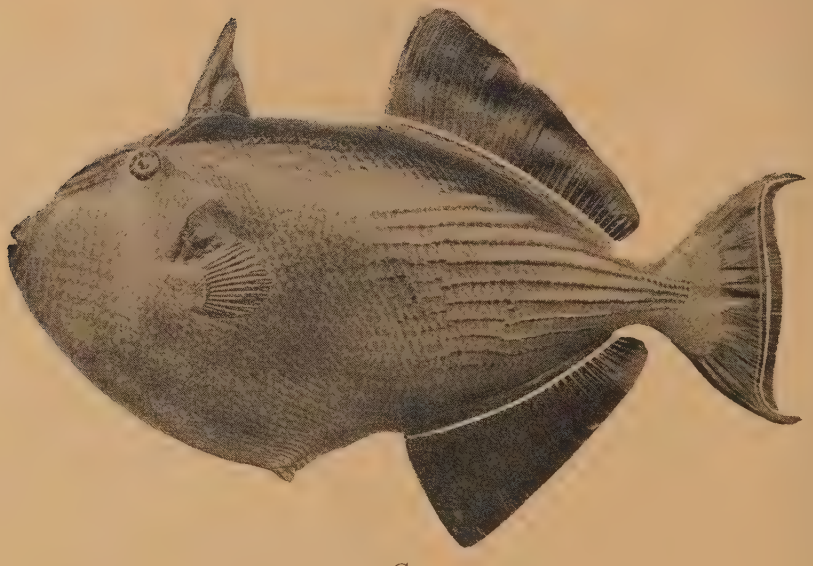


C

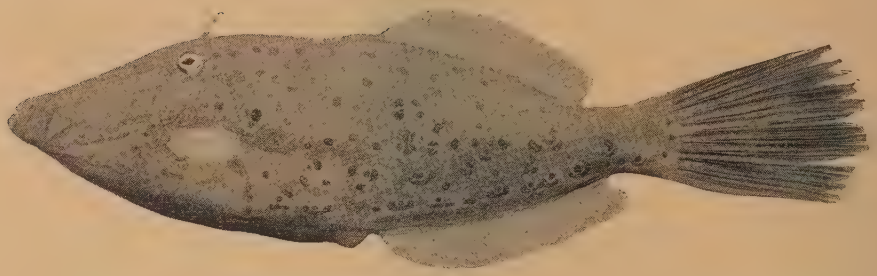
A, BALISTAPUS ACULEATUS; *B*, BALISTAPUS RECTANGULUS; *C*, MELICHTHYS BUNIVA.

A

B

A, CANTHERINES SANDWICHIENSIS; *B*, CANTHERINES PARDALIS.

A



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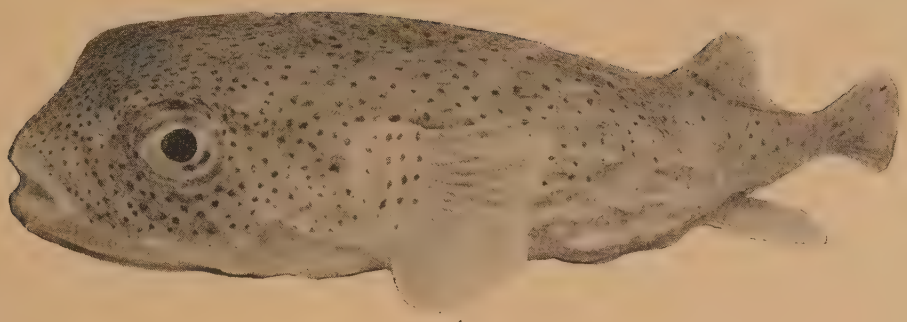

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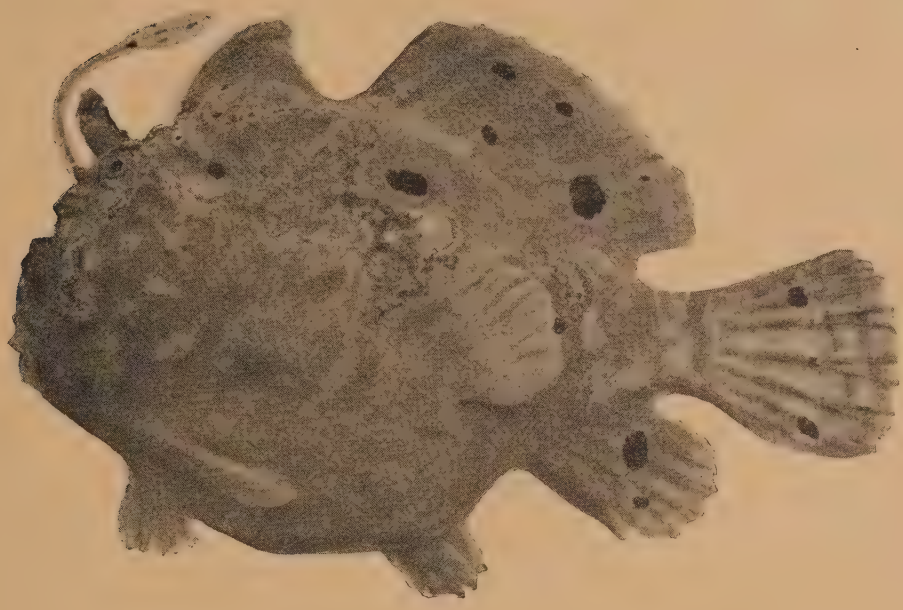

B

A, CHILOMYCTERUS AFFINIS; *B*, ANTENNARIUS COMMERSONII.

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